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THE FESTIVUS

A publication of the San Diego Shell Club

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The *Festivus* is published monthly except December. The publication date appears on the masthead above. Single copies of this issue: \$5.00 plus postage.

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<i>Santa Barbara Museum of Natural History</i>
Emily H. Vokes
<i>Tulane University</i>

Meeting date: third Thursday, 7:30 PM
Room 104, Casa Del Prado, Balboa Park

PROGRAM

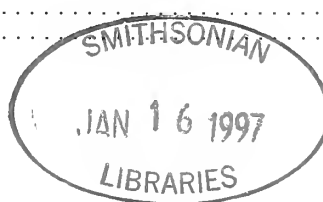
Kelp Forest Ecology -- Southern and Northern Hemispheres

The speaker for the evening, Ron McPeak, CEO of Global Biological Consultants, is a marine biologist and award winning underwater photographer who has logged over 5300 dives. Ron will present information and slides from California, Chile/Peru, South Africa, Norway and Iceland.

Meeting date: 16 January 1997
Shells of the month: cold-water shells

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CLUB NEWS

From the Minutes of the Meeting of the San Diego Shell Club, 21 November 1996

Bill Romer called the meeting to order at 7:40 p.m. Guests were introduced and announcements made. Carole Hertz announced a 35 gal. hexagonal aquarium on wooden hexagonal aquarium table with pump, etc. for sale. Brad announced that Twila Bratcher-Critchlow is interested in selling two walnut, shell cabinets. Bill alerted members to the flyers on the front table and the reprints and magazines for sale on the back table. Members were reminded to make reservations for the Christmas Party on December 14 at the Four Points Sheraton Hotel.

Bill presented the slate of officers for 1997 and after no nominations were made from the floor, the slate of officers were elected unanimously. The following are the 1997 officers: Terry Arnold, President; Wes Farmer, Vice-President; Margaret Mulliner, Treasurer; Kim Hutsell, Corresponding Secretary and Silvana Vollero, Recording Secretary.

George Kennedy introduced the evening's speaker, Tom Deméré, Curator of Paleontology at the San Diego Natural History Museum. Tom first gave an overview of the San Diego County paleontological sites and their ages and then launched into a fascinating and comprehensive look at the fossil discoveries made here over the last approximately 16 years. He began with the Cretaceous Era and worked up to the Pleistocene at each site, showing slides of the areas and the sometimes incredible finds made in each from the invertebrates to the vertebrates and some of the plants. Imagine walrus and camels, *Nautilus*, *Apporhais* and *Xenophora*. It was interesting, also, to learn of the many paleontologists from other areas who are working on material found as a result of environmental impact studies done by Deméré and his associates at construction sites in the County. Interspersed with slides of fossils were images of artists' renderings of some of the creatures and of the San Diego area as it might have looked at these times -- during which this area sometimes had an annual rainfall of 60 inches!

After a brief question period, the meeting was adjourned for refreshments, conversation and feverish buying of periodicals. The door prize was won by a guest.

Dues are Due

If you have not paid your dues, this will be your last issue. To be included on the roster for 1997, membership dues must be received by the end of January. See front page for subscription rates.

The Club's Annual Christmas Party

It was the best ever! Forty-three members and guests assembled in the brightly decorated Montfield Room of the Sheraton Four Points Hotel to celebrate together the season and the close of another successful year for the Club.

After an enjoyable cocktail hour spent socializing with good friends, Master of Ceremonies Kim Hutsell welcomed everyone. A delicious dinner was served, complete with fine wine provided by the Club. While still savoring the taste of the rich cheesecake with raspberry sauce, Kim introduced 1996 President Bill Romer, who thanked his board and committee members. Editor Carole Hertz thanked those who have helped *The Festivus*, which is completing its 27th year. She gave those attending a glimpse of the soon-to-be-released supplement and was rewarded with a round of applause. Bill then passed the gavel to Terry Arnold with wishes for a successful year.

After a few words from Terry on his plans for the upcoming year, it was time for the traditional shell gift exchange and a drawing for the beautiful centerpieces with shells provided by Don Pisor and arranged by Kay Klaus. A slide show followed with several members sharing images of interest. It was soon time to leave but many lingered, reluctant to end a lovely evening.

A Supplement to Volume XXVIII

The Festivus has published a 179 page supplement to Volume 28 entitled "An Atlas of Cowrie Radulae (Mollusca: Gastropoda: Cypraeoidea: Cypraeidae)" by Hugh Bradner and E. Alison Kay. The supplement, published at the end of December, is now available for sale. The prices, including postage, are as follows: \$25 (domestic), \$28 (overseas surface mail), \$32 (overseas air mail). Please make checks payable to the San Diego Shell Club and send to the Club address.

AN OLD NEW SPECIES OF *POLYMESODA* (BIVALVIA, CORBICULIDAE) FROM THE PACIFIC COAST OF MÉXICO

DWIGHT W. TAYLOR

P.O. Box 5532, Eugene Oregon 97405, USA

Abstract: *Polymesoda cordata* (Martens, 1865), described from the indefinite locality "Mexico," is recorded from the vicinity of Salina Cruz, on the Pacific coast in the state of Oaxaca.

Markets in Latin America are always interesting to visit, and I go to the local mercado when possible. So it was that in Oaxaca, México, in October 1988, I purchased a sample of clams of the genus *Polymesoda*, and was told that they came from Salina Cruz. This city is the Pacific terminus of the railroad across the Isthmus of Tehuantepec. A commercial port, it is without tourist attractions or facilities, and shell collectors in this part of México would not be drawn there (and in any case they tend to avoid estuaries, mud, mangrove, and mosquitoes). To the east of Salina Cruz there is a series of large lagoons, and I suppose that the *Polymesoda* came from one of these.

The species proved to be *Polymesoda cordata* (Martens, 1865), a "lost" species that has remained in limbo since its description (Figures 1 and 2). When E. von Martens described it he could provide only the indefinite locality "Mexico." The collector, Ferdinand Deppe, obtained it during one of his trips to México either in 1824-1827 or in 1828. Possibly he even obtained his material in the same way I did: at a local mercado. Since the last century it has dropped from view. No one else seems to have found it, from which one may infer it has an exceptional habitat or else a narrowly restricted range. There has been no basis until now for crediting the species to the Pacific coast, so naturally it was omitted by Olsson (1961) and Keen (1971). Hence the present title: an old species described long ago, but new to the known regional fauna.

Polymesoda (Polymesoda) cordata (Martens, 1865)

Type locality: "Mexico," F. Deppe; holotype in Zoological Museum, Berlin, illustrated by

Martens, 1890-1901, p. 546, 673, pl. 42, fig. 7.

Cyrena cordata "Wiegmann" Martens, 1865, p. 65.

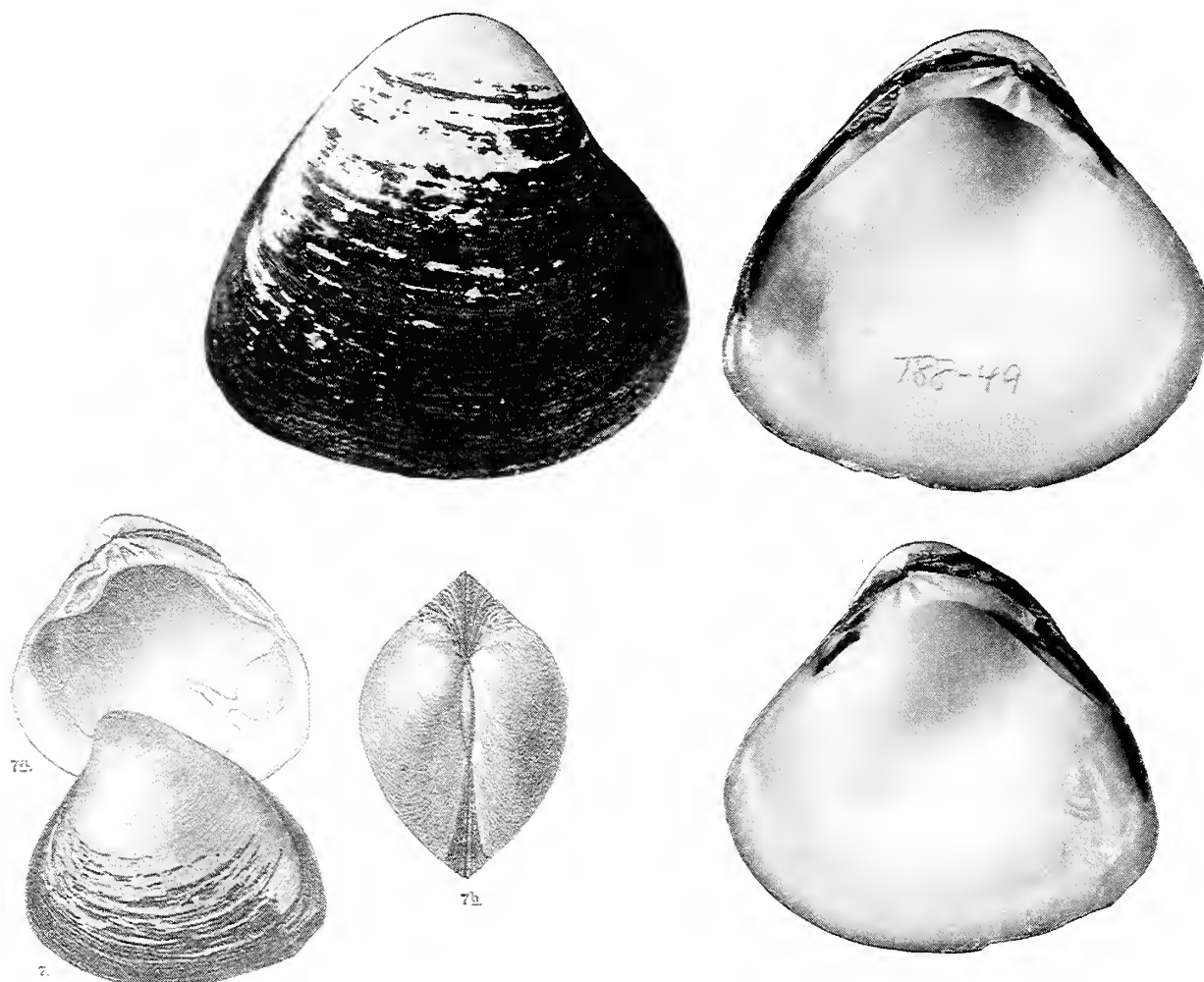
Fischer & Crosse, 1870-1902, v. 2, p. 639; reprint of original description and translation into French.

Polymesoda cordata: Martens, 1890-1901, p. 546, pl. 42, figs. 7-7b.

The shell is trigonal, thick, solid, and swollen, inequilateral, with narrow prosogyrous beaks projecting at about 40% of length. Anterior and posterior slopes are arcuate, the anterior slope less so. The ventral margin is broadly curved, more so than either anterior or posterior slopes. A low, rounded angle runs from the beak to the junction of ventral margin and posterior slope, so that the posterior end here is more narrowly rounded than the anterior. Shell sculpture consists of concentric, irregular growth lines. Most of the shell is covered by a dirt-brown periostracum. Near the ventral margin its color is yellow-olive, and the unworn periostracum retains its form. At the margin of each increment of shell growth the periostracum rises in a narrow band perpendicular to the shell surface, and each band is thrown into wavy folds.

Interior shell color is variable. Of 28 specimens, only three are white throughout. Most have some deep purple stain on the hinge plate and/or near the margins, but no shells are purple throughout. Some shells have a faint pale orange flush in the interior of the cavity, with or without associated purple coloring.

The hinge-plate is thick, with three sets of teeth: in the right valve two short, thick anterior laterals; two longer and narrower posterior laterals; and three cardinal teeth. In the left valve are a short, blunt anterior lateral, a longer and narrower posterior lateral, and three cardinal teeth. Of the three cardinal teeth, the right anterior and left posterior are narrower than the



Figures 1 and 2. (1) Holotype of *Polymesoda cordata*, copied from Martens (1890-1901, pl. 42, figs. 7-7b). (2) Largest specimen in the series purchased in Oaxaca; for measurements see text.

others, and simple, the rest being wider and weakly bifid. The cusps of the lateral teeth may be weakly striate transversely.

The pallial sinus forms an acute, narrow triangle that projects well beyond the posterior adductor scar towards the center of the cavity of the valves.

Measurements and descriptive statistics (N = 28):

	Length	Height	Breadth	H/L	B/L
Mean	38.32	36.14	24.32	.946	.633
Max.	48.18	45.62	33.90	1.02	.704
Min.	27.36	26.98	17.68	.861	.576
S. Dev.	4.658	4.262	3.395	.038	.033

The measurements of my largest specimen agree well with those of the holotype: length 48, height 44, breadth 33 mm.

In one specimen the anterior lateral teeth were transposed. The periostracal frills and long, narrow pallial sinus align the species with the typical subgenus *Polymesoda*, of which only two others are known on the Pacific coast. *P. mexicana* (Broderip & Sowerby, 1829) has a thin, lower shell, with length substantially greater than the height. *Polymesoda notabilis* (Deshayes, 1855), although solid like *P. cordata*, has a far longer shell. Both of these Pacific species lack the posterior rounded ridge that is characteristic of *P. cordata*, and its relatively short, high shell. In three

specimens of *cordata* the height even slightly exceeded the length. From the ranges cited by Keen (1971) and Olsson (1961) it may be seen that this species is geographically remote from the other two - one well to the north, one well to the south - as well as being distinctive in shell.

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BOOK NEWS

Seashells of Eastern Arabia

By: Donald Bosch, S. Peter Dance, Robert G. Moolenbeek & P. Graham Oliver. 1995.

Color photography by Neil Fletcher

Published by: Motivates Publishing, Dubai

269+ pages

Price: \$75.00

This is a large, beautiful, comprehensive collection of pictures, descriptions and information about the shells of Eastern Arabia. Color, clarity of sculpture and detail makes every specimen stand out from the very big to the tiny "micros." It is a delightful surprise to find all families represented and to see so many shells unknown to me even in my familiar families of Nassariidae, Mitridae, Turridae and Costellariidae. The descriptions are non-technical and the information is interestingly detailed.

The pages of this book are large: 12 x 9¼ inches. The specimens are numbered from 1 through 1273. The entire last section, almost one-third of the book, is devoted to the Bivalvia. Dr. P. Graham Oliver, of the National Museum of Wales, starts his section with seven large pages filled with illustrations explaining how to recognize the various patterns, ligaments, hinges, sculpture and the other essentials of the

Bivalvia, making identification easy and fun. The color pictures of the many bivalves included are large and clearly displayed with both apertural and dorsal views evident.

Robert G. Moolenbeek, a micromollusk specialist with the Zoological Museum in Amsterdam, provides the pages of well detailed small and tiny shells that appear in sections throughout the gastropods, as well as much of the other research. S. Peter Dance, of Carlisle, UK, is well known as a writer and editor of books on worldwide mollusks. He uses his expertise very effectively throughout this well organized encyclopedia.

Dr. Donald Bosch, who has collected extensively in Oman finding new shells with his wife Eloise, has authored the previous *Seashells of Oman*. Don was responsible for obtaining patrons and considerable donations to make this beautiful, expensive book possible. Obviously, the printing and production costs far exceed the retail price of \$75.00.

I recommend *Seashells of Eastern Arabia* very highly for its beauty, its information, its careful attention to detail and its value for research reference and identification for both scientific specialists and the amateur shell collector.

Bunnie Cook

NEW DISTRIBUTIONAL INFORMATION FOR
CANCELLARIA ALBIDA HINDS, 1843, AND
HERTLEINIA MITRIFORMIS (SOWERBY, 1832)
(GASTROPODA: CANCELLARIIDAE)

Carol Skoglund¹

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2559 Puesta del Sol Road, Santa Barbara, California 93105, USA

In February, Kirstie Kaiser, my husband Paul and I dredged at Bahía Navidad, Jalisco, México. We took *Cancellaria albida* Hinds, 1843 (Figure 1) on a mud bottom at 23 to 55 m. The previously known range for this species was from Punta Maldonado, in southern Guerrero, México, to the Bahía de Guayaquil, Ecuador (Keen, 1971).

On this same trip Carole & Jules Hertz found *Hertleinia mitriformis* (Sowerby, 1832) as dead intertidal shells at Sayulita, Nayarit, México. On checking our collection, I found that several years ago Paul and I had dredged live specimens off Punta Raza, Nayarit (Figure 2), which is a few miles north of

Sayulita. Our shells were taken on a mud bottom at 12 m. Keen (1971) gives the range as Panamá to Perú. Montoya, López & López (1987) extended the range north to Nicaragua.

LITERATURE CITED

KEEN, A. MYRA

1971. Sea Shells of Tropical West America: Marine Mollusks from Baja California to Peru. Stanford University Press, Stanford, Calif. i-xiv+1064 pp., ca. 4000 figs., 22 color pls.

MONTOYA, MICHEL, AL LOPEZ & JULIO LOPEZ

1987. Range extensions of several Panamic mollusks based on new records made in Nicaragua. Part I. The Festivus 19(5):43-45.

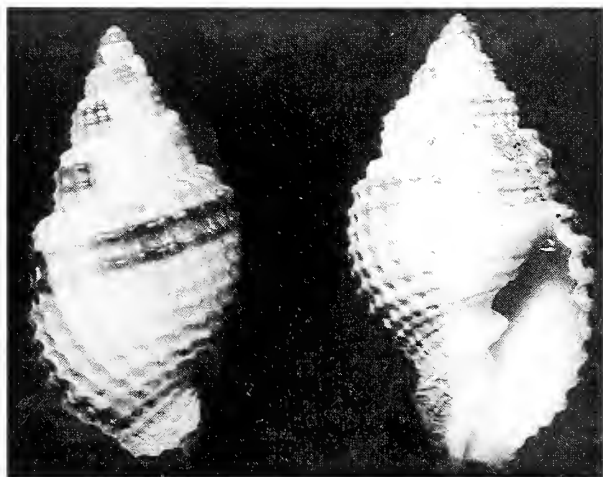


Figure 1. *Cancellaria albida* Hinds, 1843, 2 specimens: lg. 22 mm; sm; 20.5 mm. Bahía Navidad, Jalisco, México. Dredged, 23-55 m, mud bottom. Skoglund/Kaiser, 8-10 February, 1996. Photo: P. Skoglund.

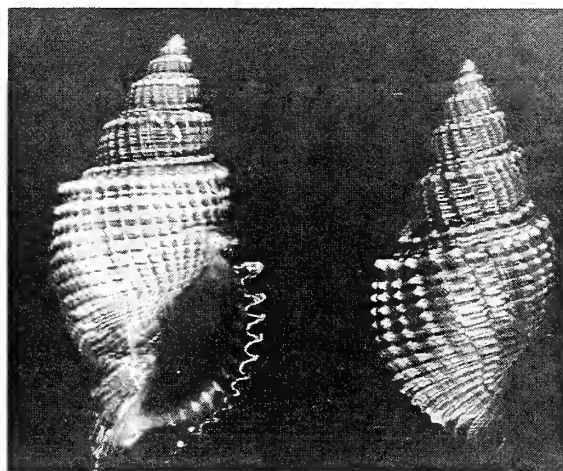


Figure 2. *Hertleinia mitriformis* (Sowerby, 1832), 2 specimens: lg. 28.5 mm; sm. 25 mm. Off Punta Raza, Nayarit, México. Dredged, 12 m, mud bottom. Paul and Carol Skoglund, 30 July 1973. Photo: P. Skoglund.

¹3846 E. Highland Ave., Phoenix, AZ 85018, USA

ANOTHER OCCURRENCE OF *CINCLIDOTYPHIS MYRAE*
DUSHANE, 1969 (GASTROPODA: TYPHIDAE),
AT SAYULITA, NAYARIT, MÉXICO

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Described from a single intertidally collected specimen from Bahía Tenacatita, Jalisco, México (DuShane, 1969), *Cinclidotyphis myrae* rarely has been reported since. A 13 mm specimen from Sayulita, Nayarit, México, was collected by Gale Sphon (Keen, 1971), and Radwin & D'Attilio (1976) figured a 20.4 mm specimen from Caleta de los Angeles, Bahía Tenacatita, Jalisco, Mexico, from the Carol Skoglund Collection. Three other dead collected specimens from Nayarit are also in the Skoglund Collection, one 12 mm specimen from Tizate and two (6 & 7 mm) from Sayulita. A beautiful 13.9 mm beach specimen from La Cruz de Huanacastle, Nayarit, is in the Shasky Collection. To my knowledge, there have been no other accounts and a note from Dr. Emily H. Vokes revealed no information on additional localities.

While collecting intertidally at Sayulita on 13 February 1996, my husband Jules and I found two beach specimens of *C. myrae* (Figure 1) among rocks and sand at low tide. This area has now had five specimens reported in a similar situation to the type. This brings the known number of specimens of this uncommonly seen species to nine. None has ever been reported living.

My thanks to Emily Vokes and Carol Skoglund for information on this species and to Paul Skoglund for the photograph of the two specimens.

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DUSHANE, HELEN

1969. A new genus and two new species of Typhinae from the Panamic Province (Gastropoda: Muricidae). *The Veliger* 11(4):343-344, figs. 1-5.

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RADWIN, GEORGE E. & ANTHONY D'ATTILIO

1976. *Murex Shells of the World. An Illustrated Guide to the Muricidae*. Stanford University Press, Stanford, CA. 284+pp., 32 pls, 192 text figs.

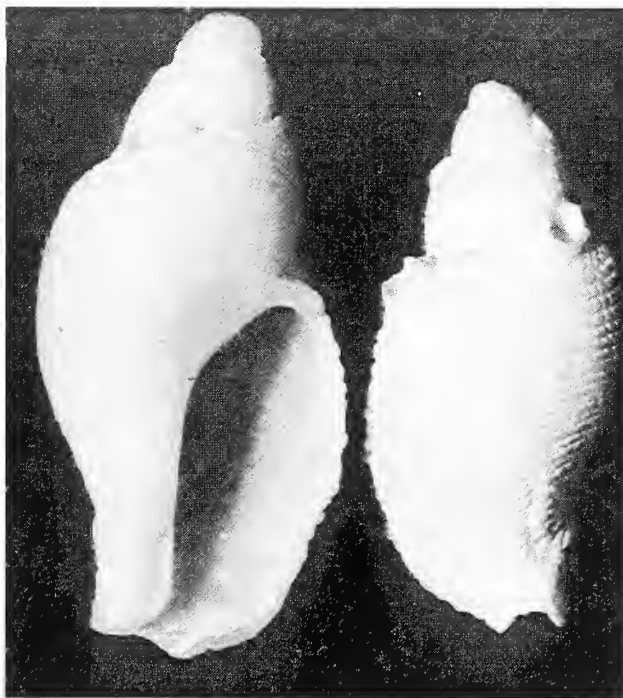


Figure 1. *Cinclidotyphis myrae* DuShane, 1969, two beach specimens, 9.3 & 11.2 mm L. Photo: P. Skoglund.

¹Mailing address: 3883 Mt. Blackburn Ave., San Diego, California 92111, USA.

1997 LOW TIDES FOR THE NORTHERN GULF OF CALIFORNIA

The entries below show periods of low tides of -4.0 feet and below. The times of low tides are given in Mountain Standard Time. To correct for San Felipe, subtract one hour from

listed times which are for Puerto Peñasco (San Felipe is on Pacific Standard Time). Tides below the midriff of the Gulf cannot be estimated using these entries.

January 7	-4.2 ft. at 6:45 p.m.	March 10	-4.6 ft. at 8:50 a.m.	September 16	-4.2 ft. at 7:20 a.m.
January 8	-5.3 ft. at 7:30 p.m.	March 11	-4.0 ft. at 9:30 a.m.	September 17	-4.2 ft. at 8:00 a.m.
January 9	-5.6 ft. at 8:00 p.m.	April 6	-4.6 ft. at 7:00 a.m. -4.2 ft. at 7:30 p.m.	October 15	-4.2 ft. at 7:30 p.m.
January 10	-5.0 ft. at 8:50 p.m.	April 7	-5.6 ft. at 8:00 a.m. -4.0 ft. at 8:00 p.m.	October 16	-4.3 ft. at 8:00 p.m.
February 5	-4.2 ft. at 6:30 p.m.	April 8	-5.3 ft. at 8:20 a.m.	October 17	-4.0 ft. at 9:00 p.m.
February 6	-5.7 ft. at 7:00 p.m.	April 9	-4.2 ft. at 9:00 a.m.	November 13	-4.3 ft. at 7:20 p.m.
February 7	-5.8 ft. at 8:00 p.m.	May 5	-4.2 ft. at 6:40 a.m.	November 14	-4.4 ft. at 8:00 p.m.
February 8	-5.7 ft. at 8:30 p.m.	May 6	-4.6 ft. at 7:10 a.m.	November 15	-4.0 ft. at 8:20 p.m.
February 9	-4.0 ft. at 9:20 p.m.	May 7	-4.3 ft. at 8:00 a.m.	December 12	-4.2 ft. at 6:40 p.m.
March 6	-4.0 ft. at 6:20 p.m.	July 20	-4.0 ft. at 7:30 a.m.	December 13	-4.2 ft. at 7:20 p.m.
March 7	-5.5 ft. at 7:00 p.m.	July 21	-4.0 ft. at 8:10 a.m.	December 14	-4.1 ft. at 8:10 p.m.
March 8	-4.0 ft. at 7:30 a.m. -5.8 ft. at 7:50 p.m.	August 18	-4.0 ft. at 7:30 a.m.	December 28	-4.0 ft. at 7:00 p.m.
March 9	-4.6 ft. at 8:00 a.m. -5.5 ft. at 8:20 p.m.	August 19	-4.0 ft. at 8:00 a.m.	December 29	-4.2 ft. at 8:00 p.m.
				December 30	-4.1 ft. at 8:30 p.m.

A NEW BOOK TO ARRIVE IN JUNE

The all new **Registry of World Record Shells** will premier at the COA Convention in July 1997. This new list is independent of any other similar project, past or present. It is scheduled for publication in June 1997 and every two years thereafter. Species will be listed alphabetically in their respective families, each species followed by its genus in brackets []. Subgenera will not be listed.

All marine species (except chitons and nudibranchs) including those with maximum sizes below 25 mm may be submitted, allowing for inclusion of small species omitted in past publications. Terrestrial, freshwater and fossil species may be added in the future.

Submissions for potential records should include:

- Family, genus and species. Subspecies and forms should be noted as such.
- Greatest obtainable measurement of specimen (in mm

to nearest tenth mm) not including attachments.

- Locality collected (i.e. False Bay, South Africa)
- Repository (i.e. your collection, museum or other).
- Date collected (only year will be listed).

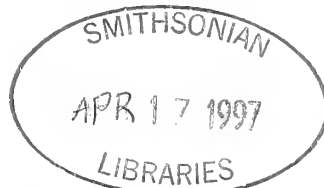
All submissions should be verified by a "recognized authority" whose name should be included to help avoid misidentification. If you do not have ready access to such a person, include a photo of each specimen with readable mm scale along with other appropriate information.

Deadline for entries is 1 May 1997 and may be submitted by E-mail, FAX or "snail mail" at the following addresses:

Kim C. Hutsell, 5804 Lauretta St. #2, San Diego, CA 92110-1670. E-mail: khutsell@ix.netcom.com.

Don Pisor, 646 North 30th St., San Diego, CA 92102. FAX (619) 234-0250.

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Meeting date: third Thursday, 7:30 PM
Room 104, Casa Del Prado, Balboa Park

PROGRAM

Fossil Abalone of the Eastern Pacific

The speaker for the evening, Lindsey Groves of the Los Angeles County Museum of Natural History, will present an illustrated program surveying the fossil

abalone of the eastern Pacific from the Cretaceous to the present and touching on the worldwide fossil record and the biogeography of the fossil abalone.

Meeting date: 20 February 1997
Shells of the month: *Haliotis* (abalone)

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CLUB NEWS

From the Minutes of the Meeting of the San Diego Shell Club, 20 February 1997

New president Terry Arnold called the meeting to order at 7:40 p.m. Terry announced that venues have been set for the Club's social events of the year (see below).

The date for the Club Auction/Potluck will be 26 April and Terry encouraged members to get their donations ready and either bring them to a Club meeting or contact Carole Hertz to arrange for pickup (277-6259). A potluck sign-up sheet was passed for the party and will be passed again at the next meeting.

Terry then reported on the recent first annual SCUM meeting (see page 16). Following the introduction of guests and infrequently-seen members, Terry turned the meeting over to Vice President Wes Farmer who introduced the evening's speaker, Ron McPeak.

It was an overflow audience that came to hear another of the always exciting programs presented by Ron. He gave a wonderful slide show on the trips he made to South Africa, Norway and Iceland diving in the kelp forests and collecting specimens for medical research.

He began his dive narrative in South Africa near the Cape of Good Hope with images of the area both above and below water and information on the beautiful *Patella* species he found there. He took us around to Piura with its huge tunicates and rich environment where he found over 300 species of algae and animals. He traveled up to Port Elizabeth, where the undersea life was more tropical and species of soft coral were found. To travel to South Africa and not see the sights of the land would have been a waste and Ron showed pictures of his travels on land photographing plants, insects, spiders, and even one of a giraffe watching him collect a beetle off elephant dung.

From South Africa we were taken to the beautiful west coast of Norway which Ron found to be a rich area with a forest of palm kelp. Among the species he found were *Apporhais pespelicani*, *Pecten maximus* and specimens of *Aeolidia papillosa*, a nudibranch also found off this coast. He noted that Norway was an expensive spot --\$18 for hamburger, coke and fries at McDonalds!

After Norway we visited Iceland, a country of 260,000 people. He found the diving less exciting there

though the scenery and the people were wonderful. Ron showed slides of the areas affected by the volcanic eruption a few years ago and talked about the changes it made. It was another expensive spot. A day of salmon fishing could cost \$500-\$1500.

It was an outstanding presentation filled with information and Ron's delightful humor.

A guest of the Bradners won the door prize.

Club Committees for 1997

In addition to the elected officers and staff listed on the masthead, the Club requires the work of a number of committees to keep the Club operating. The committees and their members are as follows: Librarian: Margaret Mulliner; Parliamentarian: Jules Hertz; COA Rep.: Don Pisor; Telephone: Jules Hertz, Kay Klaus, Linda LaGrange; Publicity: Bill Romer; Historian: Linda Hutsell; Auction: Carole M. Hertz.

The following two committees are still in search of volunteers: Club Botanical Garden Foundation Rep. and Club Host. If you are able to help, please contact President Terry Arnold at 235-8181.

The Club Calendar

The following dates for the Club's big three events have already been set. Mark your calendars so that you will not miss any of them.

Auction/Potluck: April 26th, Wes Farmer's Clubhouse

September party: September ?, Terry and Marty Arnold's garden

Christmas party: December 6th, Four Points Sheraton Hotel

A Supplement to Volume XXVIII

The *Festivus* has published a 179 page supplement to Volume 28 entitled "An Atlas of Cowrie Radulae (Mollusca: Gastropoda: Cypraeoidea: Cypraeidae)" by Hugh Bradner and E. Alison Kay. The supplement, published at the end of December, is available for sale. The prices, including postage, are as follows: \$25 (domestic), \$28 (overseas surface mail), \$32 (overseas air mail). Please make checks payable to the San Diego Shell Club and send to the Club address.

REINSTATEMENT OF *KERMIA MACULOSA* (PEASE, 1862) (GASTROPODA: TURRIDAE)

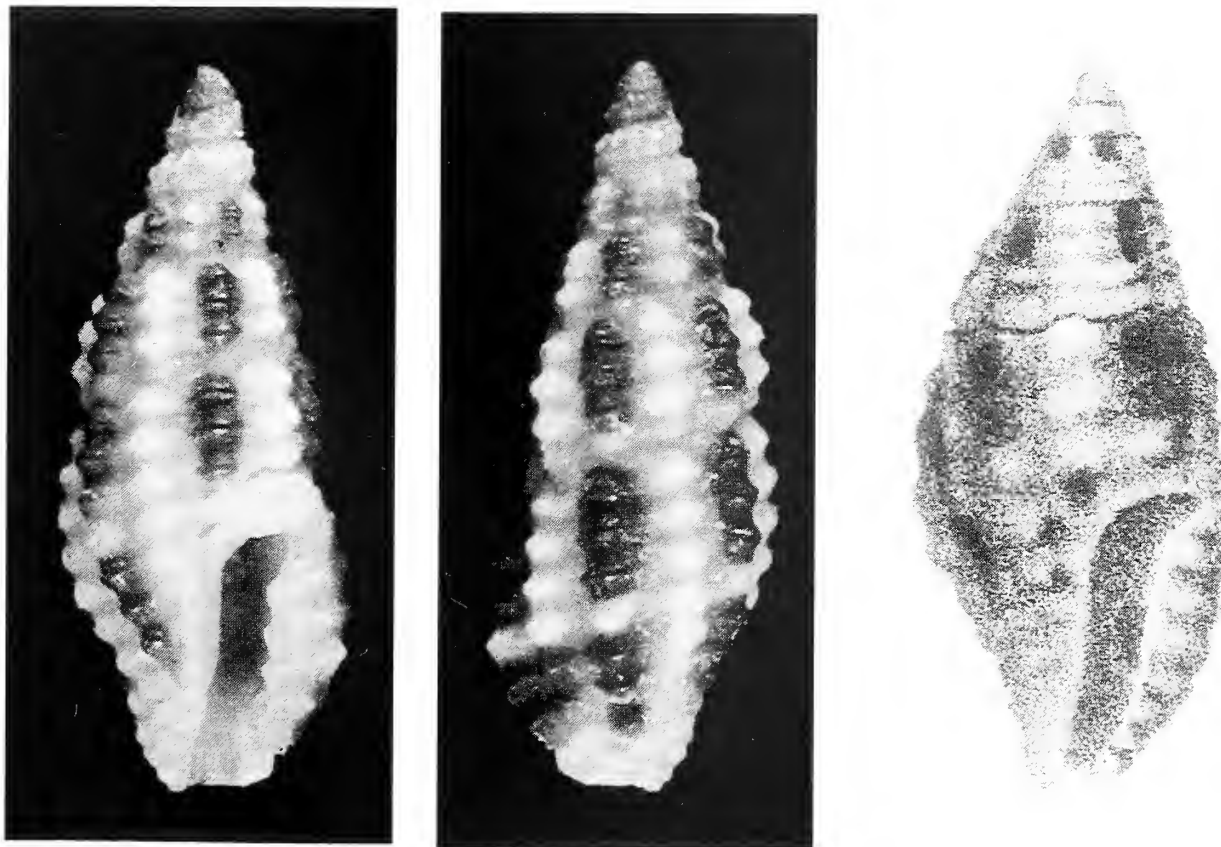
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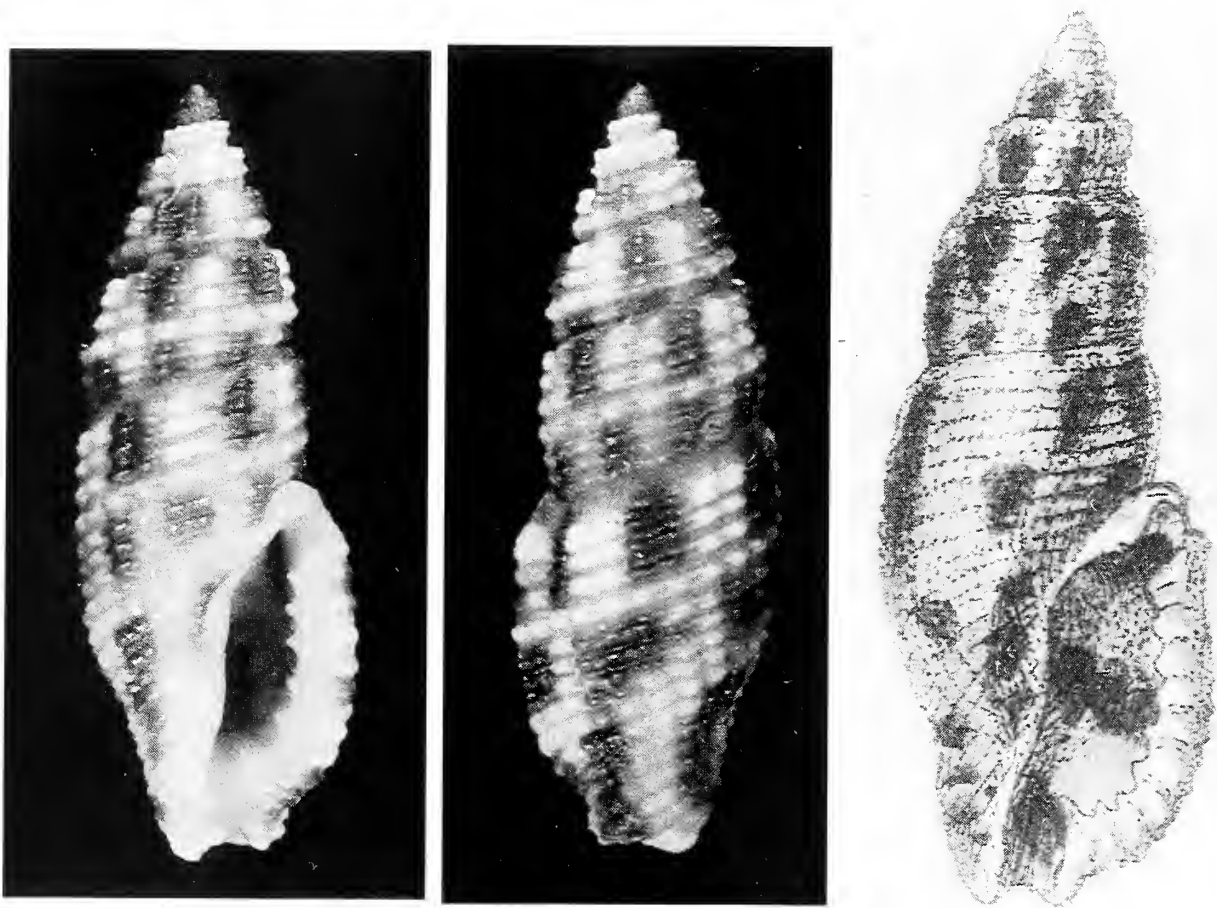
The Fifth International Reef Congress was held in Tahiti, French Polynesia from 27 May to 1 June 1985. The proceedings of the Congress were published the same year. Volume 1, the Mollusca section, was written by Georges Richard. In it Richard recognized 1030 species of gastropods, 117 species of bivalves and 10 species of cephalopods. He also synonymized numerous species.

In this paper, Richard considered *Kermia maculosa* (Pease, 1862) (Figures 1-3) a synonym of *K. felina*

(Reeve, 1843) (Figures 4-6). However, I have collected both species intertidally under coral on the same reef numerous times in Tahiti. The differences between these two taxa, when the shells are laid side by side, are remarkable. *Kermia felina* has 25-27 flattened axial ribs while *K. maculosa* has 7-9 strongly noded axial ribs. There are other distinct differences such as the protoconch and the length and shape of the aperture which the reader will easily observe from the photographs.



Figures 1-3. *Kermia maculosa* (Pease, 1862). (1, 2) length ± 6 mm, Shasky collection. (1) apertural view, (2) dorsal view. (3) After Pease (1865, pl. 15, fig. 16). Figured specimen length 5 mm, diam. 2 mm.



Figures 4-6. *Kermia felina* (Reeve, 1843). (4, 5) length 10 mm, Shasky collection. (4) apertural view, (5) dorsal view. (6) After Hinds (1844-45, pl. 7, fig. 4).

In addition to Tahiti, I have collected *Kermia maculosa* on the four additional French Polynesian islands of Moorea, Huahine, Raiatea and Bora Bora; the North Queensland, Australia locations of Fitzroy and Little Fitzroy Islands, Yule Point and Dalrymple Island; Sipidan and Mabul Islands, Eastern Sabah; Palau Sepangar, Western Sabah; and Majuro Atoll, Marshall Islands.

I previously reported a single specimen of *K. maculosa* from Isla Taboga, Panamá (Shasky, 1983). Emerson (1991), on the basis of Richard's 1985 paper, reported *K. felina* from Isla Taboga, Panamá. This, the first record of this Indo-Pacific turrid in the eastern Pacific, was founded on my report of a single specimen of *K. maculosa*. Skoglund (1992) also reported this same specimen as *K. felina*. In addition to Tahiti, I have found *K. felina* only on the island of Huahine.

Confusion regarding *K. maculosa* is not new. Hedley (1922) in his list of the synonymy of

Pseudodaphnella barnardi (Brazier, 1876), lists *?Clathurella maculosa* and goes on to say that, "If *C. maculosa* Pease should prove, as I suspect, to belong here rather than to *C. felina*, as Tryon indexed it, his name would take preference." Tryon seems to be the originator of the confusion. He claimed, in his discussion of *C. felina* that "*Cl. picta* Dunker (unfigured), is probably identical, and *Cl. maculosa*, Pease appears to be a small variety."

Concerning the authorship of *Kermia felina* which had been credited to Hinds, Cernohorsky (1980) in discussing a range extension for *Turridrupa jubata* (Reeve, 1843) called attention to the fact that Reeve had described that species six months earlier than Hinds who had apparently lent Reeve his specimens. Reeve did credit Hinds as the author. In a footnote to the above, Cernohorsky also mentioned *Kermia felina* as having suffered the same fate. C'est la vie.

ACKNOWLEDGMENTS

I wish to thank Dr. William K. Emerson for supplying me with a copy of Richard's paper. I am indebted to David K. Mulliner for photographing Hinds' and Pease's plates as well as my specimens of both species from Tahiti.

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A RARE COWRIE FOR THE CLUB'S ANNUAL AUCTION IN APRIL

A very generous donation of a 106 mm specimen of the rare *Cypraea armeniaca* Verco, 1912, has been made to the Club for its annual auction/potluck. The specimen (Figure 1), taken by a diver in 35 meters in the waters of Thoray Passage, South Australia, has a beautiful orangey base and a slightly blurred pattern on its dorsum. It is considered by Burgess (1985), in his **Cowries of the World**, to be one of the ten rarest cowries. The Club is very appreciative of this anonymous gift.

It is not too early for members and friends to prepare donations for this favorite annual event. The proceeds from the auction support **The Festivus** and Club donations to other scientific pursuits.

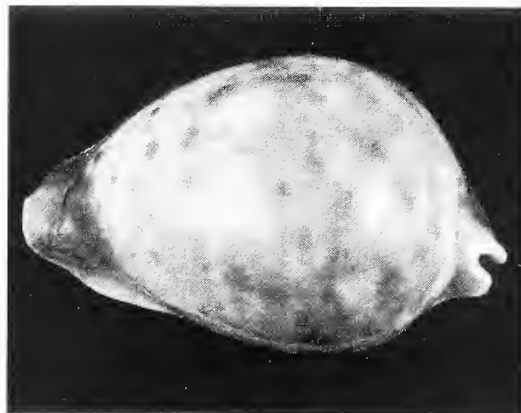


Figure 1. *Cypraea armeniaca* Verco, 1912, 106 mm. Collected by a diver in 35 m on sandy bottom among sponges, Thoray Passage, Port Lincoln, South Australia. December 1995.

DOES *STROMBUS PERUVIANUS* SWAINSON, 1823, LIVE OFF THE COAST OF BAJA CALIFORNIA SUR?

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Strombus peruvianus Swainson, 1823, has its known northern distributional limit at Islas Tres Mariás, Nayarit, México (Keen, 1971:421). Yet, Kerstitch (1993:31) reported on a living specimen of this species as far north as near Guaymas, Sonora, México.

In May 1996, the junior author visited Baja California Sur and collected a fully mature specimen of *S. peruvianus* (Figure 1) at Posada de Concepción, Bahía Concepción (south of Mulegé). Although the specimen was collected dead, it looked very fresh: the aperture vividly colored, and only some slight erosion on the spire. Unfortunately, the presence of living specimens could not be established. Collecting was done only by snorkeling, and *S. peruvianus* probably lives at depths not easily reached by snorkeling. Kerstitch (*op. cit.*) found his specimen at a depth of 37 m.

It may be rewarding to pay a visit to the area where the above mentioned specimen was collected to see whether *S. peruvianus* actually lives there, since there is always a possibility that the specimen was brought along by shrimpers or has been discarded for some other reason.

The specimen is stored in the collection of the junior author.

We thank Mr. Wim Kamphuis, husband of the junior author, for the photography.

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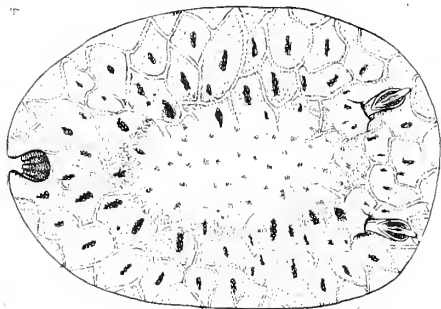
Figure 1. *Strombus peruvianus*, apertural view of 135 mm specimen. Posada de Concepción, Bahía de Concepción, Baja California Sur, México. Leg. An Kamphuis, May 1996.

RECENT DIVING ENCOUNTERS WITH SEA HARES AND NUDIBRANCHS IN SAN DIEGO WATERS

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A few days after the June 1996 meeting of the Western Society of Malacologists in San Diego, California, Sandra Millen of British Columbia, Canada, a couple of diving buddies and I went looking for specimens of *Corambe pacifica* (Figure 1) for Michael Schroedl, a researcher in Germany.



Corambe pacifica MacFarland & O'Donoghue, 1929.

Figure 1. *Corambe pacifica* MacFarland & O'Donoghue, 1929.

The lifeguard at La Jolla Cove changed our plans to dive at the kelp beds there because of the very low visibility, surge and swells. The next best solution was to find a quiet place to dive. However, Sandra, my friend Andy Miller and I ended up walking on the beach just north of the Mission Bay jetty looking for *Corambe* on the *Macrocystis* washed up on the shore. Luckily, several *Corambe* specimens and their eggs were found on bryozoans which completely covered a meter-long piece of the stipe of mangled *Macrocystis* with frondless pneumatophores. We accomplished our goal without using any compressed air and all within 15 minutes.

Next we had a recreational dive in the Flood Control Channel. The water appeared clear enough and the tide was a swift stream entering Mission Bay. Our plan was to let the current carry us into Mariners' Cove. On the

way we explored the riprap and algae of the channel. We discovered four large *Diaulula sandiegensis* and an egg ribbon, all in close proximity to each other. We found three *Flabiniopsis iodinea* and Sandra found a solitary, bright *Chromodoris macfarlandi* on some close-cropped algae. We saw three large *Aplysia vaccaria* and their eggs. One of the animals was longer than Sandra's extended forearm (45 cm). Sandra found several *Aplysia californica* at the entrance to Mariners' Cove and held one above the surface of the water so I could see it since my air was consumed and I slowly had to head back in while the others continued their dive. It was an enjoyable time.

On the afternoon of Sunday, 7 July 1996, Andy Miller and I dove at La Jolla Cove. We saw a couple of *Aplysia californica* (Figure 2) and three mature female sheep crabs, *Loxorhynchus grandis* (Figure 3).

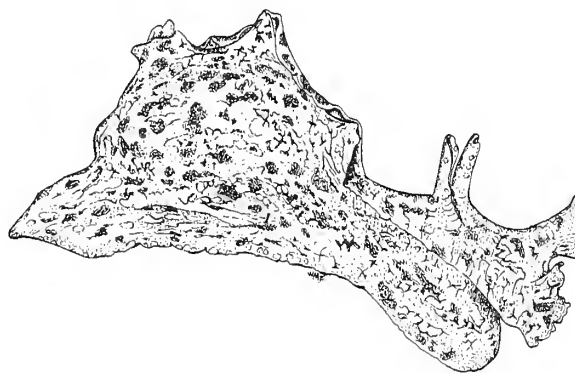


Figure 2. *Aplysia californica* Cooper, 1863.

The last crab we saw was actively feeding on a dead *Aplysia californica*. The crab had already consumed an area 25 mm in diameter and at least 10 mm deep. The *Aplysia* was the size of a closed hand or a navel orange. The two were separated during the "look see" and the crab took off on a short flight. Andy got the two

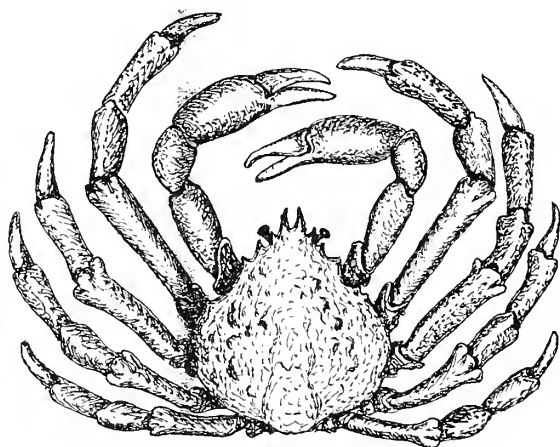


Figure 3. *Loxorhynchus grandis* Stimpson, 1857.

together again and soon the crab was grasping the *Aplysia* with its chelipeds and settling down to eat once again.

Perhaps the natural-products chemists may have something interesting to investigate here.

My thanks to Sandra Millen for her suggestions for this paper.

THE FIRST ANNUAL MEETING OF THE SOUTHERN CALIFORNIA UNIFIED MALACOLOGISTS (SCUM)

The first annual meeting of SCUM. was held in the Geology/Chemistry Building at San Diego State University on Saturday morning, January 11th. The no-fee one-day meeting was hosted and conducted by George Kennedy of that University and was a very successful venture.

The over 20 persons in attendance, both amateur and professional, gathered at 10 a.m. and socialized while having doughnuts and coffee before the informal meeting began. After his opening remarks, George suggested that people introduce themselves and the meeting was underway.

In a relaxed manner, those who wished gave information on their projects in progress. Some had

more formal presentations with slides and others gave brief rundowns on study areas and concomitant problems. Most reports were met with a variety of questions and the discussions were lively.

Because of interest, the meeting lasted longer than planned. Topics ranged from problems in fossil Cypraeidae and Haliotidae to Recent *Cerion* in the Caribbean, Panamic Recent molluscan problems, book publishing, desktop publishing, upcoming books, photography of micromollusks and museum developments.

Jim McLean of the Los Angeles County Museum of Natural History offered his institution as the site for the next annual meeting.

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THE FESTIVUS

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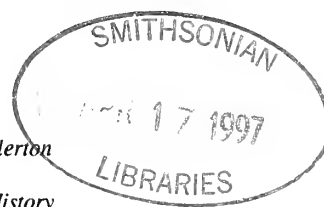
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Meeting date: third Thursday, 7:30 PM
Room 104, Casa Del Prado, Balboa Park



PROGRAM

San Benitos Island -- a Transition Zone

The speaker for the evening is Richard Herrmann, longtime Club member and professional photographer who has also won awards for his underwater images.

Richard will take us into the water in his slide program on Isla San Benitos, an area that has the southernmost kelp forest in the Northern Hemisphere.

Meeting date: 20 March 1997
Shells of the month: epitoniums

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CLUB NEWS

From the Minutes of the Meeting of the San Diego Shell Club, 20 February 1997

Terry called the meeting to order at 7:45 p.m. A correction was made to the minutes as published in **The Festivus**. It was the January, not February meeting. The minutes were then approved. Ric Crumley, a member who does not usually attend meetings, was introduced.

The library has received a generous donation of books from Twila Bratcher. A list is being processed and will be available at the next meeting. Librarian Margaret Mulliner mentioned that the Club was looking for 1996 issues of **Hawaiian Shell News** so the collection would be complete. Ric Crumley very kindly offered to donate these issues.

Terry informed members that the Club will be doing mini book auctions from time to time at upcoming meetings. Contributions are still needed for the Auction on April 26 (see column 2). Terry passed the sign-up sheet for the food for the potluck.

Billee Brown announced that she has a large shell cabinet for sale. It has 46 drawers and the dimensions are 66 H x 66 W x 24 D. If interested, contact Billee. Also the Hertzes have a 35 gal. hexagonal saltwater tank with hexagonal wood table base, complete with pump, etc. for sale. Contact them if interested.

Our speaker for the evening, Lindsey Groves from the Los Angeles County Museum of Natural History, enlightened us on the complex nature of making definitive judgments on fossil abalone. His information was based on his work with Daniel Geiger, "Review of Fossil Abalone." There are about 30 known species dating back as far as 80 million years ago. There are a number of living species that have been found as fossils. They are now found in shallow, subtidal waters. He discussed several theories on where they originated, but none of these is conclusive. He suggested that members "stay tuned" for further developments.

The winner of the door prize was Silvana Vollero. Before the meeting was concluded, Lindsey made a pitch to recruit members to speak in LA. Members then browsed and purchased many of the reprints for sale and enjoyed the tasty refreshments brought in by Kim and Linda Hutsell and Margaret Mulliner.

Silvana Vollero

The AMU/WSM Meeting in Santa Barbara

From 22-27 June 1997, the Western Society of Malacologists and the American Malacological Union will hold a combined annual meeting at the beachside Radisson Hotel in Santa Barbara, California.

Two symposia are scheduled: "Origins and Biogeography of Deep-sea Molluscan Faunas" and "Traditional versus Phylogenetic Systematics of Mollusks." There will also be a special session on "Cephalopods of the North Pacific Ocean." In addition there will be sessions for contributed papers on all aspects of malacology.

Many social events are planned as well. There will be a Presidents' Reception, evening workshops and informal slide shows, evening tour and dinner at Gainey Winery, evening reprint sale and auction, and a reception and banquet at the Santa Barbara Museum of Natural History.

On Friday, 27 June two field trips are available besides a museum open house. Offered are a Channel Island Excursion and a Paleontology Field Trip.

For further information, contact WSM President Henry W. Chaney, home phone: (805) 963-2382; work: (805) 682-4711, ext. 334; FAX (805) 963-9679; E-mail: inverts@rain.org or contact AMU President Eugene V. Coan, home phone: (415) 493-8242; work: (415) 977-5681; FAX (415) 977-5799; E-mail: gene.coan@sierraclub.org

The Club's Annual Auction/Potluck

Saturday evening, April 26th is the date of the Club's biggest social event and fundraiser of the year. It will be held, once again, at the Clubhouse at Wes Farmer's condo. A map will be sent with the April issue. Festivities begin at 5 p.m. with Dave's Punch and browsing the auction shells; dinner at 6 p.m.; the voice auction beginning at 7 p.m.

Remember the Auction supports the Club's activities such as **The Festivus** and donations to scientific causes. Your donations are needed to make the auction a success. If you have not yet donated, bring your shells (with collecting data) to the March meeting or arrange for pickup by a board member. If you want to donate or have not signed up for a potluck contribution, contact Carole Hertz (619-277-6259).

NEW DISTRIBUTIONAL RECORDS FOR
MILNERIA KELSEYI DALL, 1916 (BIVALVIA)
AND *CALLISTOCHITON PALMULATUS* DALL, 1879, EX CARPENTER MS,
(POLYPLACOPHORA) AT BAHÍA DE LOS ANGELES,
BAJA CALIFORNIA, MÉXICO

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Dredging at Bahía de los Angeles, Baja California, México, has produced a remarkable number of species previously considered to belong only to the Californian zoogeographic Province. Two more of those species are reported here for the first time. The bivalve *Milneria kelseyi* Dall, 1916 (Figure 1) was taken off NW Isla Smith, Bahía de los Angeles, from 120 to 183 m in May 1993. Although previously reported from Monterey, California, to Punta Abreojos, on the outer coast of Baja California (McLean, 1978), material in the Los Angeles County Museum of Natural History

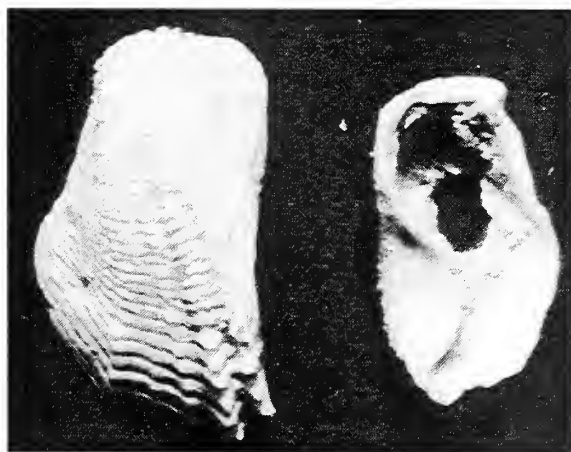


Figure 1. *Milneria kelseyi* Dall, 1916, 2 specimens (lg. spec. 3.8 mm, sm. 3.0 mm). Dredged 120-183 m, off NW Isla Smith, May 1993. Leg. P. & C. Skoglund. Photo: P. Skoglund.

(LACM 67-66) places the southern limit at Isla Asunción (27°06'N, 114°17'W) (fide Lindsey Groves, August 1996). The chiton, *Callistochiton palmulatus* Dall, 1879, ex Carpenter MS (Figure 2), from the same location in 40 to 60 m in May, 1994, was known from



Figure 2. *Callistochiton palmulatus* Carpenter MS, Dall, 1879, 13 mm L. Dredged 60-90 m, off NW Isla Smith, Bahía de los Angeles, Baja California, México, May 1994. Leg. P. & C. Skoglund. Photo: P. Skoglund.

Mendocino County, California, to Punta San Pablo, Baja California, México (Ferreira, 1979).

Other Californian species from the same locality reported earlier include: *Pteropurpura macroptera* (Deshayes, 1839) (Skoglund, 1983); *Globivenus fordii* (Yates, 1890) and *Trophon cf. cerrosensis* Dall, 1891 (Skoglund, 1988); *Iothia lindbergi* McLean, 1985

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(Skoglund, 1989); *Pseudochama granti* Strong, 1934 (Hertz & Skoglund, 1992); and *Glycymeris septentrionalis* (Middendorff, 1849) (Skoglund, 1995).

Three Californian opisthobranch species have also been reported from Bahía de los Angeles. They are *Stiliger fuscovittata* Lance, 1962, known from Alaska (Millen, 1989) to San Diego, California (Williams & Gosliner, 1973); *Okenia angelensis* Lance, 1966, known from San Francisco to Mission Bay, California (McDonald, 1983); and *Aegires albopunctatus* MacFarland, 1905, known from Vancouver Island, British Columbia, Canada, to Cabo San Quintín, Baja California, México (Bertsch, 1983).

One live specimen of another Californian bivalve species, *Adontorhina cyclia* Berry, 1947, has been reported from off Bahía de los Angeles, with major distribution from the Bering Sea, Alaska, to Isla Guadalupe, Baja California, México (Scott, 1986) and the Commander Islands and the Sea of Japan (Kamenev, 1996).

The twelve molluscan species listed above have not been reported from any other locality within the Golfo de California, México.

My sincere thanks to Dr. Douglas Eernisse for identifying the *Callistochiton*, Dr. Eugene Coan for confirming the *Milneria* identification, Lindsey Groves for checking material at the LACM and to Paul Skoglund for the photos.

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A Supplement to Volume XXVIII of The Festivus

The *Festivus* has published a 179-page supplement to Volume 28 entitled "An Atlas of Cowrie Radulae (Mollusca: Gastropoda: Cypraeoidea: Cypraeidae)" by Hugh Bradner and E. Alison Kay.

The supplement, published at the end of December,

is available for sale. The prices, including postage, are as follows: \$25 (domestic), \$28 (overseas surface mail), \$32 (overseas air mail).

Please make checks payable to the San Diego Shell Club and send to the Club address.

CHAMA ARCANA BERNARD, 1976, FROM COSTA RICA

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In going through the *Chama* material in our collection, I came across an unidentified specimen collected by Don Shasky in 1984 in 45 feet (13.7 m) at Bahía Ballena, Golfo de Nicoya, Costa Rica (Figure 1). In studying this specimen (with some animal remains still within), it looked to me to be either *Chama arcana* Bernard, 1976, or *C. pellucida* Broderip, 1835. This is probably why it remained unidentified in our collection for so long. Finally, in September of 1996, deciding it must be *C. arcana*, we brought it to Paul Scott of the Santa Barbara Museum of Natural History, who confirmed the identification as *Chama arcana*. This species has a reported distribution from Yaquina Point, Oregon, to San Juanico, west coast of Baja California Sur, México (Bernard, 1976) and into the Golfo de California from Bahía de los Angeles to Bahía San Nicholas (Skoglund, 1991).

Before Bernard's 1976 paper, this species, described from Iquique, Perú, was cited as *Chama pellucida* Broderip, 1835, by most writers (Dall, 1921:33; Grant & Gale, 1931:279; Soot-Ryen, 1932; McLean, 1969; Hertlein & Grant, 1972 and Abbott, 1974) with a distribution from Oregon to southern Baja California, México (McLean, 1969:73), to Chile (Abbott, 1974:466, pl. 21, fig. 5388) and the Islas Galápagos (Dall, 1921:33; Soot-Ryen, 1932:319). Hertlein & Grant (1972:227) remarked that the distribution from Oregon to Chile "is an unusual one....Specimens from California agree closely with illustrations of this species by Broderip and by Reeve...."

Bernard (1976:14-15, figs. 4a-c) considered *Chama pellucida* to be a southern species with a range from Paíta, Piura Province, Perú, to Chile, whereas *C. arcana* is a species of the Californian Province. He added that the Galapagan records by Dall (1921) and Soot-Ryen (1932) are probably not correct and that "*C. arcana* is entirely absent from the tropical Panamic province and its congener *C. pellucida* appears in

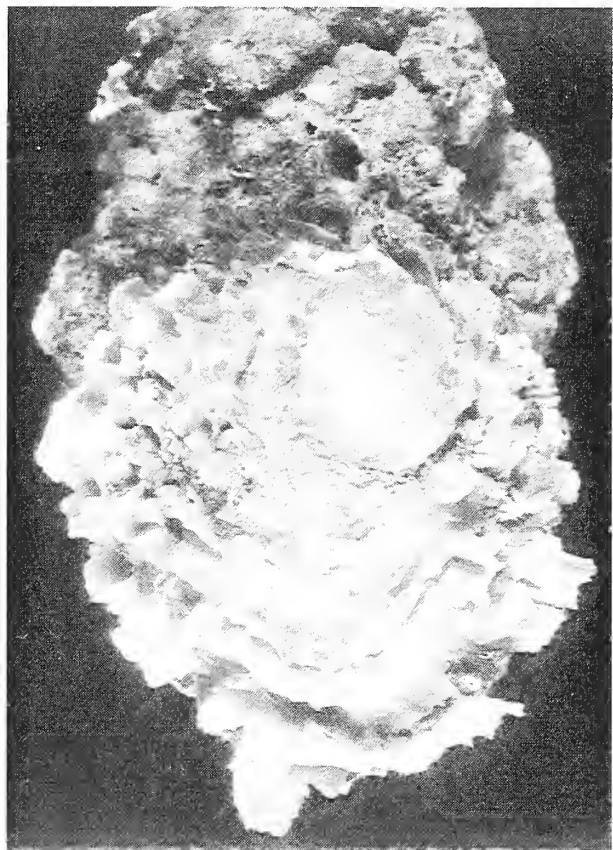


Figure 1. *Chama arcana* Bernard, 1976. Length: ± 31 mm, width: ± 32 mm. Bahía Ballena, Golfo de Nicoya, Costa Rica in 45 feet. Leg. D. R. Shasky, 15 March 1984. Hertz Collection.

similarly cool southern waters." On shell characters, he noted that *C. arcana* has no pallial sinus whereas in *C. pellucida* "a distinct, but small, pallial sinus is present just below the adductor muscle." Bernard also mentioned other differences in shell characters such as the "proportionately thicker shell tending to be anteroposteriorly elongated" in *C. pellucida* while

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"subcircular or dorsoventrally elongated" in *C. arcana*. He noted that in *C. arcana* the commissural shelf is wider than in *C. pellucida* and also has "streaks of bright color" lacking in *C. pellucida*.

The specimen shown here has no pallial sinus and has a faint flush of pink near the beak in the upper valve. This specimen puts *C. arcana* in the Panamic Province between the published ranges of both species, as suggested by Bernard. I would be interested to know if other specimens of *C. arcana* have been found between the reported distributions of the two species.

ACKNOWLEDGMENTS

My thanks to David K. Mulliner for the photograph of *C. arcana* and to Paul H. Scott for his identification of the species.

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GLUING A CORAL REEF?

An interesting item by Cynthia Wroclawski in the 28 November 1996 issue of the San Diego Jewish Times (Vol. 24, no. 24) told of the repair of damaged coral by gluing the pieces back to the reef "with a special environmentally friendly glue."

The coral reef reserve in Eilat, Israel, known as "Japanese Gardens," has many varieties of rare corals. It seems that occasionally tour boats drift into the reserve area (four times in the past three years) and damage the reef even though the boundary of the reef

is well marked by buoys.

A team of rangers and a marine biologist from the reserve are nursing the rare corals back to health. "Damaged coral fragments were collected and exposed to optimal lighting and temperature in a recovery tank promoting regeneration [and] many of them are being glued back to the reef..."

The director of the coral reef reserves in Eilat noted "that it will take many generations for these damaged corals to regenerate."

BOOK NEWS

Apple Snails in the Aquarium

By: Gloria Perera & Jerry Walls. 1996.

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Chapter 1 introduces the apple snails and the family Ampullariidae, the largest freshwater snails in the world. They are edible and can biologically control populations of medically important snails. They are, however, among the mollusks that can transmit *Angiostrongylus cantonensis*, the nematode that causes eosinophilic meningoencephalitis in people. They are found in ponds, rivers and other tropical bodies of water and, unfortunately, can become pests of taro and rice crops, especially in areas where they have been introduced. Apple snails make good pets, though unlike marine snails their shells are dull and not colorful, except perhaps for the genus *Lanistes* which has a banded shell.

Apple snails belong to the Phylum Mollusca together with land and sea slugs, oysters, clams, octopuses and squids. The apple snails belong in the Gastropoda which includes land and marine forms, and is the largest of the seven classes that comprise the Mollusca. The Gastropoda is also of great interest because some of its members transmit medically important parasites while others are economically important because they are either edible or agricultural pests.

The classification of mollusks has been based largely on external morphology but reviewers of this phylum are studying both external and internal features for identification to species level. The radula and egg masses are useful while the kidney might provide more characters. The reproductive system is likely to be of limited value in identifying apple snails. Reproductive strategies, growth patterns and mortality rates can also help because these latter characteristics are specific.

The family Ampullariidae has a tropical and subtropical distribution. In the Americas it contains the genera *Pomacea*, *Marisa* and *Asolene*; in Africa *Afropomus*, *Lanistes*, *Pila* and *Saulea*; and in Asia only *Pila*. Differences in the operculum separate the apple snails into two groups: *Pila* has a calcareous operculum while the other genera have horny or corneous

opercula. Eyes are at the base of the tentacles and there is a labial palp on either side of the mouth. The pallial cavity of the apple snails is equipped with a gill on the right hand side for respiration under water while the specialized tissue on the left side enables them to breathe in air. The left nuchal lobe takes the place of the siphon.

Chapter 2 deals with the biology and ecology of apple snails. Sexes are separate and males inseminate females by means of a penis. *Pomacea* and *Pila* lay eggs with calcareous shells on various substrata outside the water, while *Marisa*, *Lanistes* and *Asolene* lay gelatinous eggs in the water.

Apple snails live amongst aquatic vegetation and sometimes on rocks in fast-flowing waters. They feed mostly on plants, decaying organic matter or on minute animals. *Marisa* is well known as a plant feeder and consumes whatever happens to be on the plants such as egg masses and hatchlings of other snail species as well. Since the early seventies, apple snails such as *Marisa* and *Pomacea glauca* have been used as biological control agents against other freshwater snails which serve as intermediate hosts for parasitic diseases. *Pomacea glauca* also controls aquatic vegetation.

Care should be taken when collecting apple snails, particularly in schistosomiasis endemic areas of Africa and South America. Boots, gloves and long-handled nets are highly recommended to prevent contact with infested water. Transporting apple snails is simple and cheap and several methods are described.

Humans are the main predators of apple snails, taking them either as food or to use the shells to produce handicrafts. Natural predators include birds such as the snail kite and limpkin and the caiman lizard.

Chapter 3 gives a brief history of the common names mystery/apple/golden snails before discussing the best aquarium conditions for keeping them. These include clean water at about 70°F, pH between 7 and 8, access to air and a 10-hr photo period for about eight months. They will thrive if they are then allowed to aestivate in dried mud for at least four months. They can feed on lettuce, *Elodea*, fish flakes, boiled peas, carrots and the like. If it is available, they will also eat encrusting algae. Apple snails have good appetites and produce large quantities of waste so their water should be properly filtered.

They can be bought from pet shops in several color patterns: albino, xanthic and "almost fully pigmented." A melanistic variety is the least common. An expert can tell the sex of an apple snail but for the rest of us, this is difficult. Generally the male's shell is narrower and the mouth is more nearly vertical than in the female. For commercial purposes apple snails are bred in tanks with soft bottoms. After they have mated, the female lays one or more batches of eggs on any available substrate just above the surface. These will hatch in about three weeks when the hatchlings drop out into the water, feed and then aestivate for the rest of the dry season.

Chapter 4 surveys the apple snail faunas of the Americas, Africa and Asia. Three genera occur in the Americas: *Pomacea*, *Marisa* and *Asolene*. The shell of *Pomacea* is thin and globose, aperture ovate and the umbilicus open, reduced or closed. Eggs are calcareous and laid outside the water. The siphon is long and very extensible and the animals are amphibious. Fourteen species are described from Florida and the Antilles to South America. The species of the uncommon subgenus *Pomacea* (*Limnopomus*) which live in flowing waters from northern South America to Peru are also described.

Marisa is a monotypic genus and occurs in South America. Its shell is discoidal, dextral and the umbilicus is large. Males have a smaller shell than females and the aperture is more rounded. Females also have a narrower mouth and the lip is more broadly angulate or truncate. The operculum is corneous and concentric. Eggs are gelatinous and are laid beneath the water on aquatic plants. The siphon is long as in *Pomacea*.

Little information is available on *Asolene* but it has a small to large, conical to flat shell and a large mouth. Siphons are short or absent. Eggs may be gelatinous and attached to hard substrata under the water. Found in Paraguay, Uruguay, Argentina and parts of Brazil, *Asolene* comprises three subgenera: *Asolene* (*Asolene*) with three species from the Paraná River and the La Plata system, *Asolene* (*Pomella*) with *A. (P.) megastoma* from the Uruguay River and *A. (P.) americanista* from the Paraná near Iguazú Falls. *Asolene* (*Filipponea*) has three species: *A. (F.) elongata* and *A. (F.) neritiformis* from the Uruguay River and *A. (F.) iheringi* from Rio Grande do Sul, Brazil.

Four genera occur in the Old World: *Lanistes*, *Afropomus* and *Saulea* in Africa and *Pila* in Africa and Asia. Several countries prohibit trade in edible snails such as *Lanistes* and *Pila* and some African (and Asian)

species are known to carry parasites.

Pila comprises about 20 species, the best known of which come from large lakes and the more densely populated areas. Six African species of *Pila* and six from Asia are discussed but the taxonomy of the Asian species is confused. Shells are medium to large in size and dextral with convex whorls. *Pila* hatchlings have corneous opercula but unlike other apple snails these become calcified by the time the snails have reached maturity. Siphons are short. Eggs have friable shells and are laid in clusters above the water. The snails are amphibious, possessing both a gill and a lung. Breeding takes place soon after aestivation when the rainy season returns. *Pila* is an important host for the parasitic worms *Angiostrongylus cantonensis* and *Echinostoma ilocanum*, both of which can infect man.

Some American *Pomacea* species were introduced into Southeast Asia as food or aquarium pets and have subsequently become pests in taro and rice fields. Specimens from Japan have been found infected with *A. cantonensis*.

Lanistes has a sinistral shell but a dextral body. The shell is subglobose to ovate, flattened or discoidal and the whorls rounded, angular or carinate. The operculum is corneous. Eggs are non-calcareous and are laid on plants in the water. Twenty species are known and 17 of these are mentioned in this book.

Afropomus has a single species, *A. balanoidea*. Its shell is small, globose, heavy and chestnut brown with darker spiral bands. The lip is thick and the operculum corneous. Little is known about the live animal. *A. balanoidea* occurs in Liberia and Sierra Leone.

Saulea is another monotypic genus. *Saulea vitrea* has a thin, medium sized shell with a high spire and the first whorls are carinate. The periostracum is thick, hirsute and present as spiral rows. The shell has a variable color pattern with alternating dark and light bands and rows of whitish markings. The umbilicus is narrow and the operculum corneous. Like *Afropomus*, it occurs in Liberia and Sierra Leone.

Chapter 6 deals with other aquarium snails but notes that representatives of only six other families are popular in the aquarium trade. There are four possible explanations for this: most non-ampullariids are brown and dull and do not appeal to aquarists, they disturb the bottom and eat aquatic plants and they can act as agents for human parasites.

The Viviparidae have shells much like those of ampullariids and are, indeed, closely related. Their shells (*Cipangopaludina japonica*) are globose, high spired, with or without carina and may grow to 50 mm

in height. The umbilicus is narrow or closed and the mouth is small. Female *C. chinensis* reach adulthood after a year and remain fertile for an additional four years after which they die. Ten to 30 newborns appear during summer and early autumn and feed on diatoms and decaying matter. Males live for about three years and are smaller than the females. In the aquarium they prefer temperatures around 24°C. In contrast to the apple snails there are no labial palps at the mouth, the siphons are long and they breathe by means of a gill. In males the right tentacle is modified to enclose the penis. Certain species of *Campeloma* are parthenogenetic. Viviparidae are not often found in pet shops and should be collected in the field.

Most Lymnaeidae are temperate species and the family has a worldwide distribution. The genus *Radix* reaches a height of 60 mm but most others are less than 25 mm. The shell is brown to blackish with a high spire and a thin lip. The aperture is dextral and wide to narrow in shape. Tentacles are typically flattened and triangular. Although lymnaeids are hermaphrodites and lay relatively few eggs in elongated jelly clusters, they are prolific in the aquarium. They grow rapidly to maturity within three to four months and feed on vegetation, algae and detritus. Room temperatures suit them well but handle them carefully because they can transmit parasitic diseases. More than 1100 names have been given to lymnaeids and identifying them is often difficult. The authors believe that the true number of species may only be about 100.

The Planorbidae is another family whose members carry harmful parasites, particularly the schistosomes or blood flukes. Many planorbids have small, discoidal shells with sunken spires. The animals are sinistral and their blood carries the red pigment hemoglobin. Like the lymnaeids, they are hermaphroditic.

Helisoma nigricans (red ramshorn) comes from South America and has a flattened, brown shell which reaches 25 mm in diameter and is transparent. Its whorls are tight. The animal is bright red and its tentacles are slender. *H. nigricans* feeds on organic detritus and on fish eggs. Other small planorbids may be introduced into the aquarium with plants and fish. Care is therefore recommended because these snails might be carrying parasites.

Members of the Physidae are also often brought in with plants. They have small (not more than 20 mm), high-spired shells with large, left-handed apertures. Being pulmonates they are air breathers, hermaphroditic and lay their eggs in gelatinous clusters. The genera most commonly found in aquaria are *Physa*, *Physella*

and *Aplexa*. Physids are distributed within the Northern Hemisphere.

The Thiaridae have tall (the spire may reach 20-40 mm), thin shells with small apertures. Their sculpture is comprised of ridges and fine knobs. Many thiarids are prolific breeders and population densities of up to 10,000 m⁻² have been reported. They may be parthenogenetic and males are often rare or absent. The female "holds the fertile eggs in a brood pouch in the neck, releasing only female young." Thiarids feed on decaying matter leaving the aquarium clean. Three species are commonly sold via the aquarium trade. *Thiara granifera* (the quilted melania) is brown with small protuberances, flattened shoulders and may reach 30 mm in height. *Melanoides tuberculata* (red-rimmed melania) is also commonly found. It has a brown ribbed shell with red dots and markings, a reddish brown band around the base of the shell, curved shoulders and reaches 36 mm. The third species is *M. turricula* (faune melania) which might, in fact, be a form of the red-rimmed melania. It can be distinguished by the absence of the reddish basal stripe and the vertical ribs. These three thiarids were introduced into Florida and serve as the intermediate hosts of the human lung fluke, *Paragonimus westermani*.

The Neritidae live mainly in marine and brackish waters but some species may be found in freshwater aquaria. Their shells are oval and heavy with a very low spire. Two neritids are mentioned: the European *Theodoxus fluviatilis* and the American *Neritina reclinata*. *Theodoxus fluviatilis* has a black or yellow shell with variable whitish markings. It grows to about 10 mm in height and 15 mm in diameter and is found in cool, running water with abundant plant cover. Sexes are separate and eggs are laid in jelly capsules, one snail hatching from each capsule. They grow quickly. The shell of *N. reclinata* is green and reaches about 20 mm in both height and diameter. It feeds on diatoms and other algae from hard substrata and plants.

If these non-apple snails become too numerous, they can be controlled with chemicals such as copper sulfate. Unfortunately, copper sulfate is also toxic to other animals and plants. Other chemicals are available but they are expensive, require careful handling and are not as effective against thiarids. Effective alternatives to the use of chemicals to reduce snail numbers are removing them by hand, introducing snail-feeding fish or turtles or even giving them to lizards to eat!

Except for the ampullariids, the authors do not see a bright future for aquarium snails. This is largely because they are not attractive, can become agricultural

pests or carry parasites which may infect people.

As far as I know, this is the first time a book such as this has come onto the market. It is a "status report" on the apple snails and serves to introduce the amateur aquarist to the medical and economic importance of mollusks. It also provides a synopsis of the apple snails of the world which will answer many questions about them and open the door to opportunities for further investigation.

This book also successfully conveys the need for further research on freshwater snails in general, especially to "thoroughly study them in terms of their anatomy." I must wish Gloria Perera and Jerry Walls

"happy hunting" when, hopefully, they venture again into the world of the apple snails.

Overall this is an informative book that is likely to become essential reading for the amateur aquarist and a source of reference for the professional. Finally, the information on other freshwater snail families may stimulate interest in snail keeping amongst hobbyists. A glossary and bibliography form a useful complement to the text and photographs in this book.

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CORRECTION: Please remove the FAX number for Doug von Kriegelstein on the roster. It was an erroneous listing.

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THE FESTIVUS

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COME TO THE AUCTION/POTLUCK

Saturday evening, 26 April, 5:00 - 11:00 p.m.

Summer Hill Clubhouse, 3575 Ruffin Rd., San Diego

(See map on last page for details.)

There will be no regular meeting this month.

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CLUB NEWS

From the Minutes of the San Diego Shell Club Meeting - 20 March 1997

Terry welcomed everyone to the meeting at 7:50 p.m. The minutes of the February meeting, as published in *The Festivus*, were approved. Terry announced that Jules Hertz had unexpected quintuple bypass heart surgery a few days ago and is doing well. We wish him a speedy recovery.

The group welcomed two guests, Beverly and Earl Underwood, from out of town. Margaret thanked Ric Crumley for his donation of the 1996 *Hawaiian Shell News*. This completes our library's set of this publication. Terry mentioned that a committee is still working on forming the Club's web page.

Kent Trego made a presentation to Kay Klaus. Kay was given a copy of the new cowry book in appreciation of her hospitality with the Saturday afternoon meetings to "just talk shells."

Wes introduced our speaker for the evening, Richard Herrmann, a distinguished speaker and award-winning photographer. Richard, who spoke on San Benitos Island, actually a group of three islands, began by pointing out their location on a map of Baja California, Mexico. Their location is interesting because marine species from the north (Californian Province) and from the Panamic Province are found there. Richard took two boat trips there, most recently in August 1996. Since the area is not a well-known diving spot, the islands are unspoiled and wild. He showed beautiful slides of nesting ospreys, elephant seals with their pups, and endemic plants. One of Richard's favorite areas is a cover of purple hydrocoral with orange anemones. He said it is not uncommon to find a California lobster and moray eel sharing the same crevice. One slide was of a large sea star which could not be identified by anyone in the group. If anyone is interested in visiting this fascinating area, Richard is organizing a boat trip in October. It sounds like a great adventure!

Billee Brown announced that she has some diving equipment for sale. Contact her directly, if interested.

Chuck Reitz won the door prize. Members enjoyed the display of epitoniums brought in by Larry Catarius and the refreshments brought by Margaret Mulliner.

Silvana Vollero

Come to the Annual Auction/Potluck Saturday evening April 26th

It's still not too late to plan to donate to and attend the Club's fantastic Annual Auction/Potluck. [See the map on the last page of this issue for directions.] The event will begin at 5 p.m. again this year with "Dave's Punch," viewing of the auction goodies, and the opening of the silent auction. This will be followed by dinner at 6 p.m. with the auction starting PROMPTLY at 7 p.m.

There will be some incredible items in the voice auction in addition to all sorts of eclectic articles at the silent auction and big bargains at the \$1 and \$2 tables. In addition to the *Cypraea armeniaca* and other exceptional and uncommon shells, there will be rare books for auction some of which are listed on page 30 of this issue.

Do remember that besides being the Club's favorite social event, the auction is the Club's fundraiser which makes *The Festivus* possible as well as providing funds for our library purchases, the Science Fair, and other activities supported by the Club. It's always a great party and the food is always outstanding as well!

For those attending, please remember to bring your potluck contribution to serve 12 along with serving utensils and your own eating utensils.

If you have any questions or have not been contacted for either auction donation or food sign-up, contact Carole Hertz (277-6259).

Come to the auction and have a great time!!

The Pacific Shell Club's Sea Shell Show

The Pacific Shell Club announces its Sea Shell Show on Sunday, April 20th from 10:30 a.m. to 5:00 p.m. at the Cabrillo Marina Community Building, Berth 28 (not the Aquarium), San Pedro, California. Admission is free and there is free parking. It is announced that there will be displays of worldwide and local shells, shells with "educational displays for children of all ages and free grab bags of shells for them."

For additional information call (310) 519-8889, (310) 326-1455 or (818) 981-8533.

SCALE WORMS ON NUDIBRANCHS

ROLAND C. ANDERSON

2000 Minor E. #8, Seattle, Washington 98102, USA

Polychaete worms are known for their commensal habits, many living with mollusks. The sea mouse *Aphrodita japonica* frequently has the small clam *Pseudopythina rugifera* attached to the bottom of its wide foot (MacGinitie & MacGinitie, 1968). The large polychaete *Cheilonereis cyclurus* lives in the shells of moon snails (*Polinices lewisii*) with the hermit crabs *Pagurus armatus* in the Puget Sound region (*ibid*). The worms come out and share the food of the hermit. The sea stars *Asterina miniata* and *Luidia foliolata* are frequently overrun with thin black polychaete worms *Ophiodromus pugetensis* (MacGinitie & MacGinitie, 1968; Zann, 1980; Kozloff, 1987). Up to 20 may live on one sea star giving it the appearance of a severe worm infestation but there is no harm being done to the star. Scale worms are particularly known for their commensal relationships; MacGinitie and MacGinitie (1968) state "among the polynoid worms there are probably more commensal species than in any other group of polychaetes." Scale worms are so-called for the two rows of scales (elytra) running down their backs.

Perhaps the best known of the commensal scale worms is *Arctonoe fragilis*, which is commonly found in the grooves of the sea stars *Evasterias troschelii*, *Leptasterias hexactis*, *Pisaster ochraceus* and *Orthasterias koehleri* (Pettibone, 1953). It is unusual not to find a commensal scale worm on some of these stars.

Arctonoe fragilis may be the most common commensal scale worm on the Pacific Coast and maybe the most frequently seen but *A. vittata* may have the most types of hosts, some of which are familiar mollusks. Its hosts include sea stars, the giant chiton *Cryptochiton stelleri*, the fissurellids *Diodora aspera*, *Puncturella cucullata* and *P. multistriata*, other gastropods (*Acmaea mitra*, *Cidarina cidaris*, *Fusitriton oregonensis*, *Haliotis kamtschatkana*) and even other polychaetes (Pettibone, 1953). I have also found *A. vittata* on three species of Pacific Northwest nudibranchs.

Arctonoe vittata is easily distinguished from its

congeners by the dark streak across the 7th and 8th segments (Pettibone, 1953; Kozloff, 1987). The base color of the worm is flesh-colored. Other *Arctonoe* worms assume the color of their hosts (MacGinitie & MacGinitie, 1968), presumably for camouflage. The color of *A. vittata* may blend well with *Diodora aspera* or *Cryptochiton stelleri* but stands out conspicuously on the bodies of its nudibranch hosts.

I have found *A. vittata* on *Dirona albolineata*, *Archidoris montereyensis* and *A. odhneri* (see Figures 1 and 2). The *Dirona albolineata* was collected from

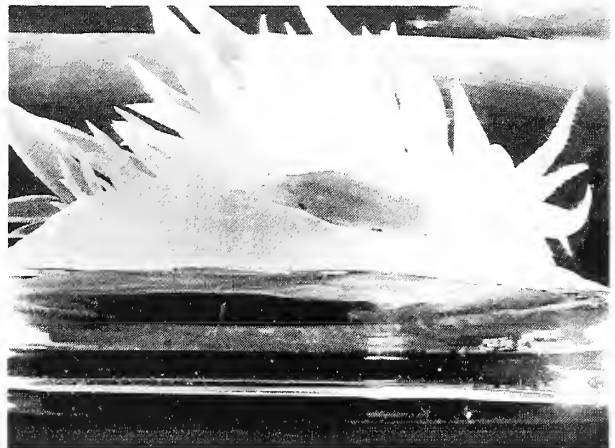


Figure 1. *Dirona albolineata* MacFarland in Cockerell & Eliot, 1905, photographed *in vitro* showing its commensal scale worm *Arctonoe vittata*. Photo: Leo J. Shaw, Seattle Aquarium.

Three Tree Point on Puget Sound about 20 miles south of Seattle and the *Archidoris* were collected at Neah Bay, Washington. All were collected by scuba diving at about 10 m depth. The scale worms were noticed on the nudibranchs directly after they were placed in display tanks at the Seattle Aquarium. We have numerous *A. montereyensis* living on the pilings supporting the Seattle Aquarium but these haven't yet been examined for scale worms.

As can be seen from the photos, the scale worm on the *D. albolineata* is residing on the left side of the

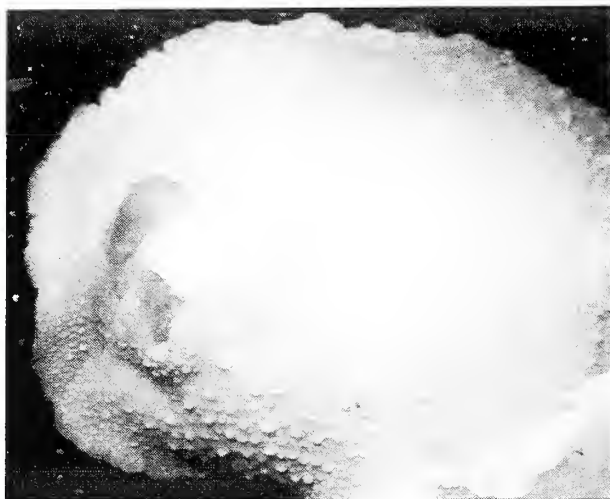


Figure 2. *Archidoris montereyensis* (Cooper, 1863) with a commensal scale worm near its anus. Photo: Leo J. Shaw, Seattle Aquarium.

nudibranch just below the cerata and the one living on the *A. odhneri* is circling the branchial plume around

the anus. Scale worms on *A. montereyensis* were living on the dorsum to one side or the other. One *A. vittata* along with its *A. montereyensis* host was preserved for examination and identification and sent to the California Academy of Sciences (CASIZ 108655, 108656). These observations add to the already long taxon list where *A. vittata* have been found.

Thanks to Hans Bertsch and Terry Gosliner for consulting with me on this article and to Leo J. Shaw for the photography.

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A GENEROUS DONATION TO BENEFIT THE CLUB LIBRARY

Thanks to the generosity of Twila Bratcher-Critchlow, the Club's library has been greatly enriched. Twila has donated over 80 publications (books, journals and magazines) to the Club. Some of those which are not already in the library will be added to the Club's holdings and others will be auctioned to raise funds for future purchases.

Some of the books are exciting indeed. An original of the Sowerby (1844) *Thesaurus Conchyliorum* Part V containing monographs of the genera *Terebra* [by Hinds] and *Voluta* with hand-painted illustrations; Swainson (1840) *A Treatise on Malacology or the Natural Classification of Shells and Shell-Fish*; the 1968 reproduction of Swainson's (1834) *Exotic Conchology*, a limited edition of 2,000 copies with 48 plates; Turton's (1857) *Manual of the Land and Fresh-Water Shells of the British Islands* with 12 hand-painted plates and

numerous b&w illustrations; the original Keep (1881) *Common Sea-Shells of California*; and Wood (1857) *The Common Objects of the Sea Shore Including Hints for an Aquarium* with 11 hand-colored plates and numerous b&w illustrations. The aforementioned will be sold at the Club's Auction/Potluck on April 26th.

In addition to these rare books, many other difficult to obtain and useful references are part of this gift. Those publications that have been accessioned into the Club library [each noted as a gift of Twila Bratcher-Critchlow] will be included in the updated library list being prepared by Librarian Margaret Mulliner with the help of Kim Hutsell. This list will be available to members at an upcoming Club meeting.

The Club wishes to express its gratitude to Twila not only for her munificent gift but for her considerable regard for the Club.

BURSA NANA LAYING EGGS

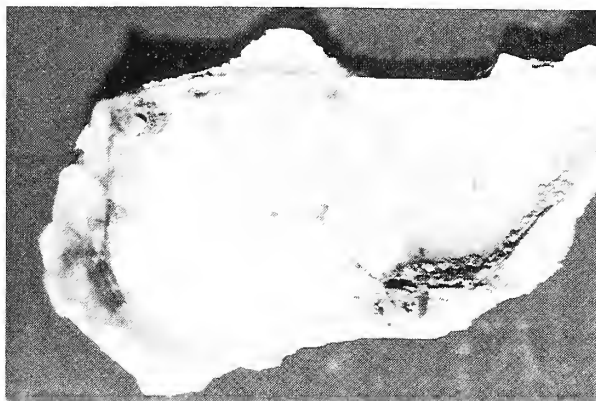
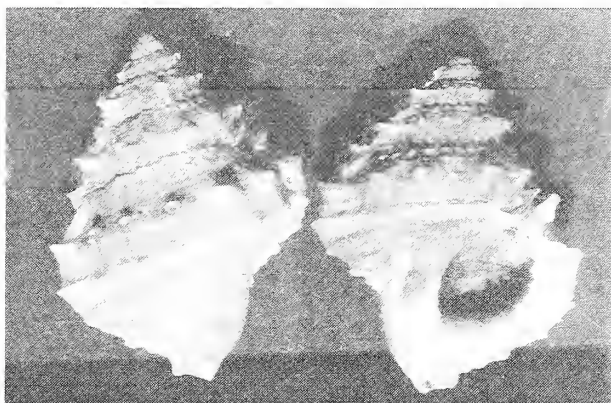
CAROLE M. HERTZ¹

Associate, Santa Barbara Museum of Natural History,
2559 Puesta del Sol Road, Santa Barbara, California 93105, USA

In February 1996, Carol and Paul Skoglund, Kirstie Kaiser, my husband Jules and I spent several days in Barra de Navidad, Jalisco, Mexico. Jules and I collected in the intertidal zone and the Skoglunds and Kirstie dredged. An exciting find on 8 February was two specimens of *Bursa nana* (Broderip & Sowerby, 1829) on their egg capsules. The two specimens figured here (Figure 1) were taken in 30-45 m in Bahía

Navidad. The adults fell off the eggs when placed in alcohol.

One female laid her egg capsules in a venerid bivalve fragment. The second female's egg capsules (shown in Figures 2, 3 and 4) were laid in a fragment of *Harpa crenata* Swainson, 1822. The specimens and the eggs are now in the collections of the Santa Barbara Museum of Natural History (SBMNH 143256).



Figures 1, 2 (l-r). (1) *Bursa nana* (Broderip & Sowerby, 1829), two females 35.5 & 34.6 mm L, found on egg capsules in 30-45 m, Bahía Navidad, Mexico. (2) Egg cluster of *Bursa nana* in fragment of *Harpa crenata*. Photos: P. Skoglund.



Figures 3, 4 (l-r). (3) Egg capsules of *B. nana* shown in Figure 2, enlarged. (4) Close-up of several capsules shown in Figures 2 and 3. Photos: P. Skoglund.

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SACOS: AN INEXPENSIVE AND ROBUST UNDERWATER SAMPLING DEVICE FOR SCUBA DIVERS

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Abstract: A simple, robust and inexpensive sampling container system (SAmpling Containers On String: SACOS) constructed from clear film containers and lined up on a nylon string is described for collection of particularly small organisms by SCUBA divers. Field testing in tropical and temperate conditions has been very successful.

Introduction

Underwater sampling by SCUBA divers, particularly of small organisms, can be very frustrating for a number of reasons. Three problems are addressed in this present contribution: 1) the difficulty of handling small containers especially in cold water where thick gloves must be worn; 2) loose airfilled containers stuffed in a mesh bag get easily lost, whether empty or containing specimens; 3) the lids of the frequently used film canisters are not attached to the containers and easily become lost. Hinged canisters are available, but the hinges weaken with time.

As far as I am aware the design described below has not been reported elsewhere. However, as it is so simple, I do not claim exclusive rights to it; parallel evolution is easily conceivable.

Step by step instructions

- 1) Obtain a number of clear 35 mm film canisters (135 format) from a local photographic supply shop. Fuji containers - no endorsement for the film, just for the container - are particularly useful, as they are clear and permit the view of the specimens in the vials. Six to eight canisters result in a handy size.
- 2) Bore a hole through the center of the bottom as well as the lid of the container with a drill bit or a pair of scissors. The hole should be a little smaller than the diameter of the string (see Step 3, Fig. 1).
- 3) Singe a nylon string approximately 3 mm in diameter at one end and shape the molten tip into a tapering

point.

- 4) Feed the string through the bottom and the lid of each container. Moving the container up and down, the string should offer some resistance. This ensures that the cord seals the hole as well as possible to minimize loss of water when the containers are taken out of the water. Otherwise use a smaller drill bit in Step 2.
- 5a) Tie the singed end of the string in a larger knot and singe it again to prevent the knot from slipping (Fig. 1:e, Fig. 2A:a).
- 5b) Tie the container bearing part of the string in a loose loop and singe the knot to prevent slipping. The advantage of the loop is that a larger number of containers can be kept in a compact fashion, but the loop may entangle with the rest of the gear.
- 6a) Tie a hand loop at the end opposite the knot (Step 5a) or with the loose end (Step 5b, Fig. 2A:d).
- 6b) Tie the other end to another object such as the dive slate, buoyancy compensator or sampling net (Fig. 2B).

Field testing

The above described SAmpling Containers On String (SACOS) have been used since 1988 in the Mediterranean, Bermuda, Scotland and California. They have been used during the annual field classes to Banyuls sur Mer and Ile de Bendor: Southern France by the University of Basel, and during the expedition to the St. Kilda Archipelago: Outer Hebrides: Scotland (Cadman et al., 1993; Ellis et al., 1995). No disadvantages have been found. Organisms captured range from sponges, hydrozoans, flatworms, prosobranchs and opisthobranchs to ophiuroids and small fishes. The individual samples are organized in a linear fashion and data such as habitat and depth etc. can be noted on a dive slate. Samples are kept separate so that toxic and trophic interactions do not take the toll

of some samples.

The individual containers (Fig. 1) are opened with a flip of the thumb even with 5 mm neoprene gloves and are closed with a pull of the string for the linear SACOS model (Step 5a, Fig. 2A:c): manual coordination skills are minimal, so the least amount of attention is diverted from other underwater activities. Accidental opening of the containers has not been observed even when boarding a Zodiac after a dive in the rough Irish Sea.

As all parts of SACOS are made from plastic, no corrosion or rotting of any parts occurs. The arrangement is extremely durable and needs no care. Only the weight of dive tanks can crack the film containers. Some of the original SACOS are still used by the author to this day. When SACOS are taken to the surface, they lose some water, but the containers do not dry out completely even after an hour out of water (see also Steps 2 & 4).

In situations where little extra equipment is taken under water, the SACOS can be tied to the buoyancy compensator. However, when a dive slate, a camera and a flashlight are used while diving in a dry suit, it seems better to keep SACOS further away from the

body, i.e. to attach it to the dive slate rather than to the buoyancy compensator. Multiple SACOS can be color coded using variously colored strings. Consider the spectral absorption properties of water: white, yellow and blue can easily be distinguished at depth; green, blue and red should be avoided in a combination.

Acknowledgments

I would like to thank the many dive partners from the Vertebrate Lab at the University of Basel, Switzerland and the Marine, Environmental and Evolutionary Research Group at the University College of Swansea, Wales. Lindsey T. Groves, James H. McLean and two anonymous referees read the manuscript and made valuable comments.

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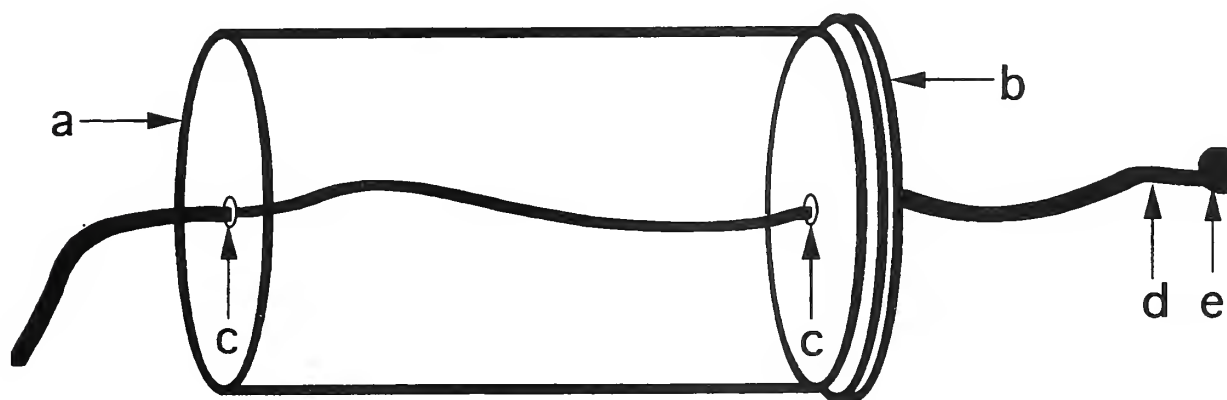


Figure 1. Individual unit of SACOS; a: film container; b: lid of container; c: drilled holes for string; d: 3 mm nylon string; e: terminal knot (Step 5a).

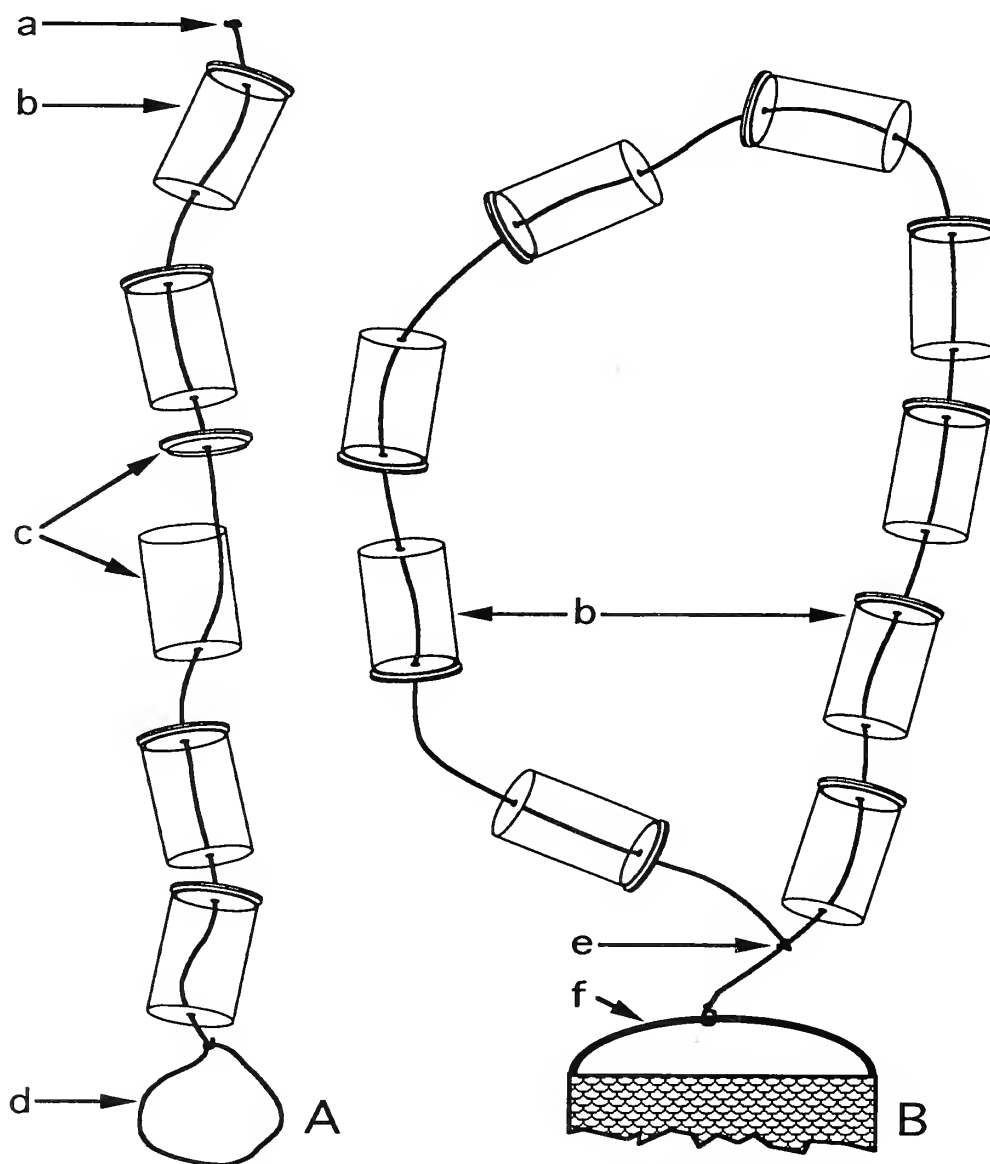


Figure 2. Entire SACOS; A: linear model (Step 5a) with a hand loop (Step 6a); B: loop model (Step 5b) attached to a sampling net (Step 6b); a: terminal knot; b: closed SACOS unit; c: open SACOS unit with lid attached to string; d: hand loop; e: loop knot (Step 5b); f: handle of sampling net.

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THE FESTIVUS

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The *Festivus* is published monthly except December. The publication date appears on the masthead above. Single copies of this issue: \$5.00 plus postage.

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Meeting date: third Thursday, 7:30 PM
Room 104, Casa Del Prado, Balboa Park

SMITHSONIAN

MAY 16 1997

LIBRARIES

PROGRAM

The Ocean Monitoring Program in San Diego

Ron Velarde, with the Marine Biology Laboratory at the City of San Diego Ocean Monitoring Program, will give an

overview of the ocean monitoring program in San Diego. His slides will feature mollusks found in these areas.

Also

Club Science Fair Winner Benjamin Ladd McClain will give an overview of his winning project, "Effect of Light-

blocking Pollution on Gastropod Behavior Patterns" and receive his Club award.

Meeting date: 15 May 1997
Shells of the month: San Diego shells

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CLUB NEWS

The 31st Underwater Photo Festival

The San Diego Underwater Photographic Society presents its 31st annual San Diego Underwater Photo Festival on Friday and Saturday May 16th and 17th at 8 p.m. with a different show each night. The Master of Ceremonies will be Howard Hall. There will be previews, interludes and slide series -- all original work -- no TV reruns.

The event will be held at Mandeville Auditorium, UCSD and doors will open at 7 p.m. Tickets are \$13 general admission and \$9 for students. Tickets can be purchased at San Diego dive shops, Ticketmaster and the Mandeville box office, student tickets at UCSD box office at Price Center.

A Report on the 1997 Greater San Diego Science and Engineering Fair

The Club's Science Fair judges, Terry Arnold, Kim Hutsell and Dave Mulliner chose as the Club's winning project in the senior division, "Effect of Light-blocking Pollution on Gastropod Behavior Patterns." The project, which dealt with the effect of various light levels on the movement patterns of *Norrisia norrisi* both in the presence and absence of food (kelp) also won a senior division second place award in its category.

The winner, Benjamin Ladd McClain, a tenth grader at Morse High School, will present an overview of his project at the May meeting and receive his Club award. He has chosen as his prize, Barnes' *Invertebrate Zoology*.

The Annual Channel Islands Dive Trip August 17th and 18th

A two day shell-diving trip (August 17-18) in the area just south of Point Conception, long known as a highly desirable shelling location, is planned by a group of divers. The cost is \$210. It will once again be on board the charter dive boat *Peace*, which offers exceptional food, service and hot tub. Call soon if interested. For more information and to reserve a spot call: Larry Buck (619) 792-5404 or Bill or Cheri Magee (805) 658-8286 or (805) 984-2025.

The Club's Annual Auction/Potluck

The Club's Auction/Potluck, with almost 50 people attending, was a great success. Friends enjoyed "catching up" with each other and viewing the auction table during the social hour complete with wine, soft drinks and "Dave's Punch" made up by Bill Romer. The potluck dinner with its always delicious main courses, salads and desserts saw members come down the stairs with heaping plates of goodies.

All were ready to get down to serious bidding by the 7 p.m. start of the voice auction. Auctioneer Carole Hertz led the group through some spirited, and sometimes hilarious, bidding for choice material: *Cypraea armeniaca*, a Tony D'Attilio drawing, a Sowerby original section of the *Thesaurus Conchyliorum*, a *Cypraea aurantium*, a beautiful and huge *Tridacna* valve brimming with colorful pectens, choice books and many other specimen shells both Recent and fossil.

During the break, members had dessert while they clustered around the \$1-3 table and checked on their hoped-for items among the varied selections in the silent auction.

As the auction neared its close it was noted that the shell *Cypraea venusta sorrentensis* (#4 on the list) was missing. Will those in attendance please check to see if it was picked up by mistake.

The Club's sincere thanks go, once again, to our host, Wes Farmer, for making his Clubhouse available for the auction, to those who bid and bought and those who made the auction possible by their generous donations.

Following, in alphabetical order, is a list of those who donated material to the auction.

Terry Arnold, Pat & Ed Boyd, Marge & Hugh Bradner, Twila Bratcher-Critchlow, Billee Brown, Larry Buck, Larry Catarius, Wes Farmer, Carole & Jules Hertz, Linda & Kim Hutsell, John Jackson, Kirstie Kaiser, Kay Klaus, Wendy & Bob Koch, John LaGrange, Mike Mason, Margaret & Dave Mulliner, Rosemary & Frank Pierce, Jeanne & Don Pisor, Chuck Reitz, Dale Roberts, Nancy & Bill Schneider, Don Shasky, Carol & Paul Skoglund, Kent Trego, Virginia Upton and Silvana Vollero.

CALIFORNIA CLAM CONUNDRUMS

EUGENE V. COAN

891 San Jude Ave., Palo Alto, California 94306-2640, USA

There are many things that we do not understand about the clams of the northeastern Pacific Ocean, and there are many unexpected distributional records of Panamic taxa that occasionally have been found in southern California. On the other hand, there are a very few true conundrums, real mysteries that defy easy explanation. My intent here is to feature a couple of these problems in the hopes that others might help to answer them.

The Incident of the Woven Penshell

In the Santa Barbara Museum of Natural History (SBMNH 28288) there is a single intact specimen of an *Atrina* (*Servatrina*) brought to the museum by a collector who reported she found it washed up on a remote Santa Barbara County beach near Jalama (34.5°N) (Figure 1). Although this area is subject to heavy surf, the paired valves are in almost pristine condition. This specimen is completely unlike the unique, rare *Atrina* (*Servatrina*) *oldroydii* Dall, 1901, which occurs from San Pedro, California, to Punta Pequeña, Baja California, México. The latter has a dark brown to almost black shell, with thick commarginal lamellae and only a trace of radial ribs.

The mysterious Jalama specimen seems to be *A. (S.) texta* Hertlein, Hanna & Strong, in Hertlein & Strong, 1943 (p. 166, pl. 1, figs. 9, 10). It is very similar to the type specimen of this species in the California Academy of Sciences [CAS 064321] from Gorda Bank, Baja California Sur, and to a specimen of this rare species from Guaymas, Sonora, Mexico, in the Los Angeles County Museum of Natural History. This Panamic species, which has been given the common name "woven penshell," is similar to the Caribbean *A. (S.) serrata* (G. B. Sowerby I, 1825), but has more closely spaced radial ribs.

Paul Scott, of the Santa Barbara Museum, and I considered the possibility that it was mislabeled or a specimen from some other province, but we cannot easily match it to any other species, and, although the original collector cannot now be located, we have no

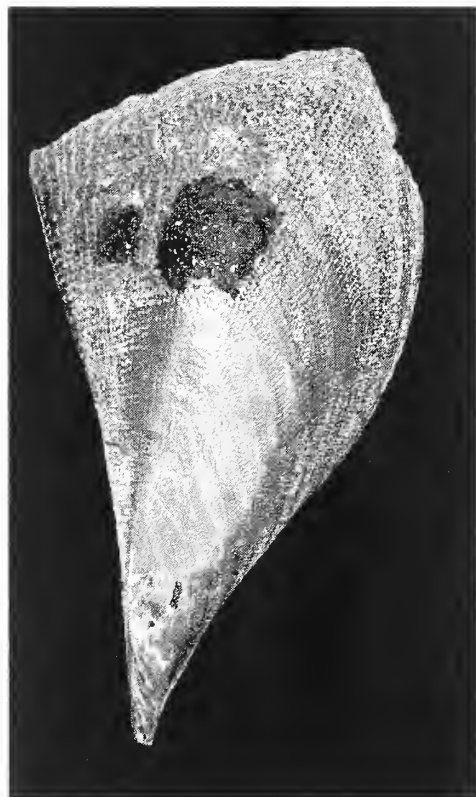


Figure 1. *Atrina* (*Servatrina*) *texta* Hertlein, Hanna & Strong, in Hertlein & Strong, 1943; SBMNH 28288 Jalama, California; length, 259 mm.

reason to doubt her word about having collected this specimen at Jalama.

The rarity of *Atrina oldroydii* in California, and the rarity of *A. texta* even within the Panamic province, demonstrates that some members of the Pinnidae are not easily obtained and may have a patchy distribution. On the other hand, there is a huge distance between central California and the Gorda Bank, and finding an intact, fragile *Atrina* on a remote Californian beach seems

unlikely. Only the discovery of another specimen will demonstrate that this species truly occurs in California and that this was not a misidentified species from another province.

The Secret of the Sulcate Spoonclam

Sometime around the last turn of the century, Mrs. Ida Oldroyd, found a somewhat damaged specimen of an odd *Periploma* washed up on the beach at San Pedro, California. She sent the specimen to William H. Dall at the Smithsonian Institution, who described it as *P. sulcata* Dall (1904: 122-123). Indeed, the species was unique, with numerous commarginal undulations and microscopic wrinkles, and he proposed a new subgenus for it, *Halistrepta*. Four years later, Dall (1908: 427, pl. 15, fig. 10) (Figure 2) provided the first and only illustration. The specimen [USNM 109318] has since been further damaged.

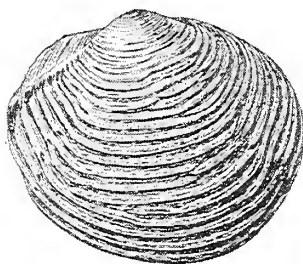


Figure 2. *Halistrepta sulcata* (Dall, 1904); holotype, USNM 109318; after Dall (1908: pl. 15, fig. 10); specimen length, 32 mm.

In spite of nearly 100 years of intensive onshore and offshore collecting in southern California and northern Baja California, no one has ever reported another specimen, and we have never come across one in collections. This species has been given the common name of "sulcate spoonclam."

In the meantime, a second species of *Halistrepta*, which is now generally accorded full generic status, has

been described, *H. myrae* (Rogers, 1962: 229-231) [holotype: CAS 064660], but this species differs in having a truncate posterior end, a more produced rostrum, and concave antero- and posterodorsal margins. It would be wonderful if at least one more specimen of this strange southern California species came to light.

ACKNOWLEDGMENTS

I acknowledge the assistance of Liz Kools of the California Academy of Sciences and Alan R. Kabat at the National Museum of Natural History for obtaining the numbers of two type specimens. The figure of the *Atrina texta* was prepared by Paul H. Scott of the Santa Barbara Museum of Natural History.

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1943. Eastern Pacific expeditions of the New York Zoological Society. XXXII. Mollusks from the west coast of Mexico and Central America. Part II. New York Zoological Society, *Zoologica* 28(3): 149-168, pl. 1. (6 Dec.)

ROGERS, MARK E.

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Announcing the III Congreso Latinoamericano de Malacología

The third annual meeting of the Congreso Latinoamericano de Malacología will be held on 13-17 October in Ensenada, Baja California, México at the Centro de investigación científica y de Educación superior de Ensenada, B.C. The meetings will be given

in Spanish and Portuguese. The cost for non-members is \$120.00 US, members of SMMAC @ \$100.00 US and \$75.00 US for students.

For further information, consult the internet (<http://www.cicese.mx/oceano/acuicultura/IIIclama.ht>)

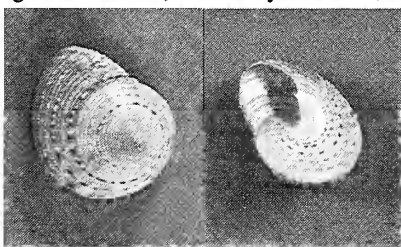
NEW DISTRIBUTIONAL DATA ON THREE EASTERN PACIFIC GASTROPOD SPECIES

JOHN A. BISHOP

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Two years ago I purchased a computer and since have been studying hard to master its complexities. One of the first things I used it for was to set up a database for my shell collection. This took hours of time but has had a number of rewards, one of which was the ability to easily print up identification cards for the shells containing the usual information such as genus, species, author, locality, habitat, distribution, collector and date. A second benefit occurred when this information was printed in tabular form and allowed for a quick comparison of the locality where I found a specimen and the published data on its distribution. This brought three shells to my attention that represented new distribution records for their species.

The first is *Calliostoma aequisculptum* Carpenter, 1865 (Figures 1 and 2). In May of 1989, I went on a

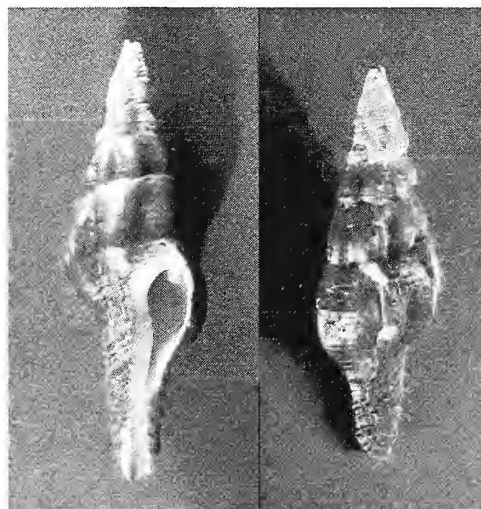


Figures 1, 2. *Calliostoma aequisculptum* (1) spire view (2) basal view. Height: 15 mm, diameter: 17 mm.

most enjoyable trip to Costa Rica with Larry Buck, Dave Leighton and Ron McPeak, the trip organizer. We collected shells in the area of Playas del Coco in the Golfo de Papagayo in the northwestern part of the country (10°30'N, 85°45'W). Larry did most of his collecting using SCUBA gear. In an article about this trip published in the June 1990 issue of *The Festivus*, Larry listed 79 different species that he found. I did my collecting snorkeling in the shallower areas and looking in the beach drift. It was there in the drift that I found a well preserved specimen of *C. aequisculptum*. Review of distributional data in *Sea Shells of Tropical*

West America by Keen (1971) indicates a range from Mazatlán (23°14'N, 106°8'W) to Acapulco, México (17°0'N, 100°0'W) and no modification of the distribution is noted in the more recent publication, *Additions to the Panamic Province Gastropod Literature, 1971 to 1992* by Skoglund (1992). Playas del Coco is a southerly extension of the distribution by 6°30' latitude or 390 miles.

The second new record is for *Latirus mediamericanus* Hertlein & Strong, 1951 (Figures 3 and 4). In July 1966, my son and daughter-in-law invited me to spend a week with them in Puerto Vallarta, Jalisco, México (20°40'N, 105°3'W). Their condo was located on a rocky beach on the southern part of Bahía Banderas. The live specimen of *L. mediamericanus* that I found was on a sandy bottom among large boulders covered with brown algae at



Figures 3, 4. *Latirus mediamericanus* (3) apertural view (4) dorsal view. Height: 55 mm, width: 18 mm.

a depth of 4 meters. Distribution for this species as recorded by Keen (1971) is from Manzanillo (19°0'N, 104°3'W) to Santa Elena, Ecuador. Another extension

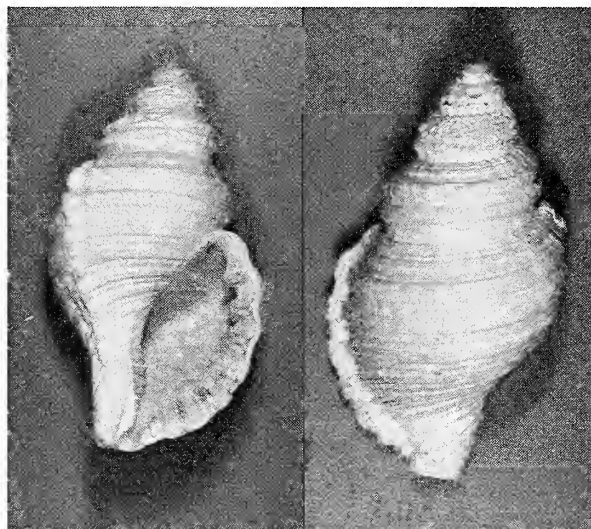
of the range to Isla Gorgona, Colombia is noted by Skoglund (1992). This, therefore, represents a northern extension of the range by 1°40" latitude, about 100 miles.

The third is *Cymatium parthenopeum keenae* (Beu, 1970), a subspecies of *C. parthenopeum* von Salis, 1793, which is widely distributed throughout the tropical seas of the world. *C. (p.) keenae* (Figure 3) has a distribution from La Paz, Baja California Sur, México to the Islas Galápagos. Skoglund (1992) notes the extension of distribution to Bahía San Carlos, Sonora, México (28°0'N, 111°0'W). On 9 September 1996, I left Bahía de los Angeles, Baja California by boat with two of my sons to circumnavigate Isla Angel de la Guarda. The first night we camped on a beach just south of Punta El Pulpito on the northeast part of the island (29°22'N, 113°10'W). The beach consisted of coarse rocks and sand. Above the high tide line we found a variety of shells, two porpoise skeletons and two specimens of *C. (p.) keenae*. Although bleached, one of the shells was in relatively good condition. This places the species 1°22" or 80 miles north of its previously reported distribution.

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1990. Shell collecting off Playa de Cocos, Costa Rica. *The Festivus* 22:83-85.



Figures 5, 6. *Cymatium parthenopeum keenae* (5) apertural view (6) dorsal view. Height: 105 mm, width: 60 mm.

KEEN, A. MYRA

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Correction: In Roland Anderson's article in the April issue of *The Festivus* (XXIX (4):29-30), the

specimen identified as *Archidoris montereyensis* (Figure 2) is *Archidoris odhneri* (MacFarland, 1966).

Additions to the Roster

Clover, Phillip, P.O. Box 339, Glen Ellen, CA 95442.
(707) 996-6960.
Hickman, Carole S., University of California, Museum

of Paleontology, Berkeley, CA 94720-4780.
Doris (Dee) Vawter, 3208 Bonita Mesa Road, Bonita,
CA 91902. (619) 479-7687.

REPORT OF A NINE-PLATED *TONICELLA LINEATA* (WOOD, 1815)

GEORGE METZ

121 Wild Horse Valley Dr., Novato, CA 94947, USA

Unusual specimens, freaks, abnormalities or whatever you care to name them have always been of great interest to shell enthusiasts. Members of the Class Polyplacophora characteristically have eight plates. Notations of those with more or less plates have infrequently appeared in the literature. Langer (1978) in a rather extensive study collected some 5000 chitons of three species in the New England area and found that the incidence of seven and a half, seven and six plated specimens represented only .05% of the entire group and did not appear to be affected by depth or environmental factors. Abnormality of plate numbers have been reported on the west coast of the United States by Chace et al (1930), with reports of two seven-plated specimens. Berry (1935) reported on a single nine-plated *Nuttalina scabra* Reeve, 1847. Roth (1966) reported on several with seven plates and Burghardt et al (1969), noted twenty-one with less than eight plates. Nine-plated specimens are rarely reported.

In 1966 a nine-plated *Tonicella lineata* (Wood, 1815) was collected intertidally on a boulder at Kuluk Bay, Adak Alaska. (Figure 1). It appears to have an extra plate at the seventh plate position.

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CHACE

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ANGER, PAUL D.

1978. Abnormality of shell plates in three chitons from New

England. The Veliger 21(2):274-275.

ROTH, BARRY

1966. Some abnormal chitons from Washington state. The
Veliger 9(2):249-250.

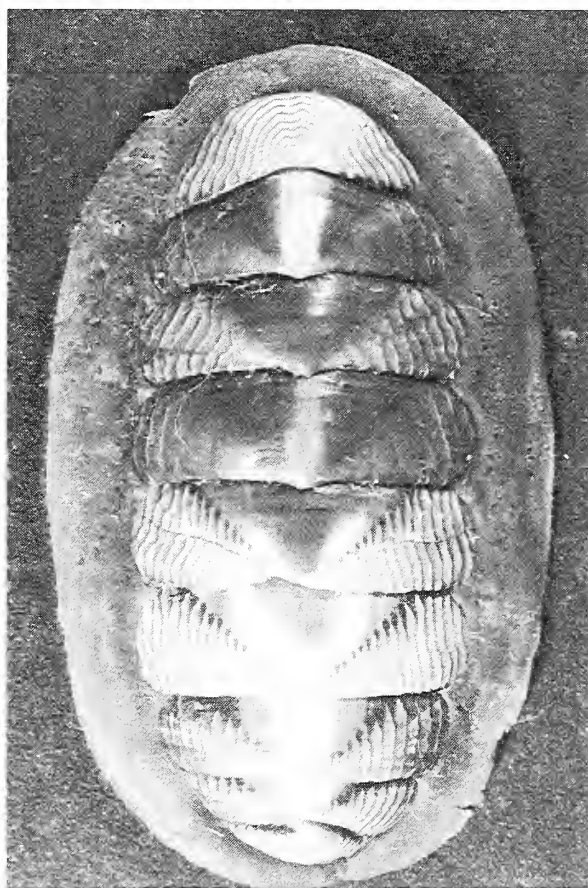


Figure 1. *Tonicella lineata*, 37 x 22 x 5 mm, Kuluk Bay, Adak Is., Alaska. Collected by George E. Metz, 1 May 1966. Photo: George Hanselman.

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THE FESTIVUS

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Meeting date: third Thursday, 7:30 PM
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PROGRAM

Sand Communities in La Jolla and the Coronados -- Cnidarians to Fish

Dr. Marc Chamberlain, Associate Professor of Neurosciences at UCSD, is an award-winning underwater photographer who has dived all over the world. He will share images taken while diving off La Jolla and the Coronados.

There will also be a mini-auction of books

Meeting date: 19 June 1997

Shells of the month: deep-water shells off southern California

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CLUB NEWS

From the Minutes of the San Diego Shell Club Meeting - May 15, 1997

Terry Arnold called the meeting to order at 7:45 p.m. Several guests were welcomed. The minutes of the March meeting were approved and there were no treasurer or librarian reports due to Margaret Mulliner's absence. The lively bidding at this year's auction yielded great results and will assure the publication of *The Festivus* for another year.

The Club's Science Fair winner this year was Benjamin McClain. His topic was "The Effect of Light Blocking Pollutants on Gastropod Behavior Patterns." Terry invited Benjamin to the floor to receive his certificate and an IOU for his book and to give an overview of his project to the members. Benjamin concluded that solid waste and light blocking did indirectly affect gastropods, though none of his specimens died. His interest in gastropods began with contact with marine biologists.

Wes Farmer introduced the evening's presenter, Ron Velarde. Ron has been a marine biologist for the City of San Diego since 1978 and works on taxonomy for the ocean monitoring project. He told that the area bays were dead in the early '60s. Then, in 1963, the sewage treatment plant was opened with the outfall 2½ miles off Point Loma. In 1994, the outfall was extended 2 more miles and the waters have been monitored since 1963. The program includes monitoring the water quality and ocean floor environment, bio-accumulation, toxicity levels, and pipe surveys. New species are still being found. His conclusion was that we are doing very well. Preliminary results show that conditions were worse in 1985 than they are today. The next step is to have a storm drain system.

Ron was the winner of the drawing. The meeting was adjourned at 9:10 p.m. for the usual social time and refreshments. Refreshments for the meeting were brought in by the Hertz and Voller/Petroski families.

Silvana Voller

Silver Anniversary Meeting of the COA

The Conchologists of America will celebrate its 25th Anniversary at its July 13-18, 1997 meeting at Captiva Island, Florida, hosted by the Sanibel-Captiva

Shell Club. The meeting will take place at the South Seas Plantation Resort and Yacht Harbour and will feature an Opening Ceremony, Welcome Party and 25th Anniversary Dinner as well as a 25th Anniversary Gala after the Bourse. There will be the Annual Auction, and a Special Mini Symposium highlighting new products and techniques for collections. A sale of The Walter Sage Fabric Collection with all proceeds going to the Walter Sage Memorial Fund will also be held.

Five field trips are planned - low tide collecting on the mud flats (July 12, 18); 2 tank day dive (July 18); 2 tank day night dive (July 15); Cabbage Key narrated boat trip and Mound Key State Archaeological Site (July 18).

For additional information contact: Anne Joffe (941) 472-3151 or Howard and Susan Roux (941) 514-0541.

15th Edition of *A Catalog of Dealer' Prices...*

Of Sea and Shore Publications announces the 15th (1997) edition of *A Catalog of Dealers' Prices for Shells: Marine, Land & Freshwater*. The 200+ page book with 18,000 entries is available for \$19.50 plus postage (\$3 domestic or overseas surface). Send to Of Sea and Shore Publications, P.O. Box 219, Port Gamble, WA 98363, USA.

Additions and Changes to the Roster

Changes

Hollmann, Michael, e-mail address has been changed to: Hollmann@Fexmed1.dnet.gudg.de

Additions

Deynzer, Bev & Al, Showcase Shells, 1614 Periwinkle Way, Sanibel Is., FL 33057

A Club Host is Still Needed

Bill Romer, who was Club host for several years, has generously been acting Club host this year, as well, since there have been no volunteers. Club members and guests enjoy the refreshments after the meeting and it would be a shame to have to end this social time.

If you are willing to be host for the rest of this year, please contact Terry Arnold at (619) 235-8181.

NEW RANGE, DEPTH AND SIZE RECORDS FOR SOME PANAMIC PROVINCE GASTROPODS

DONALD R. SHASKY

4990 Nighthawk Way, Oceanside, California 92056, USA

As more and more collecting is done in areas beyond the established geographical and depth limits of species, I believe it is important to publish new records. Most, if not all, of the species listed below are well known to those of us who are ardently interested in the Panamic Province. The species listed below were all self-collected, unless otherwise noted. The arrangement is according to Keen (1971) as modified by Skoglund (1992), with Keen numbers where appropriate. All specimens are in the Shasky collection.

77. *Calliostoma bonita* Strong, Hanna & Hertlein, 1933. This species is known from Mazatlán, Sinaloa to Acapulco, Guerrero (Keen, 1971) and Bahía San Carlos, Sonora, México (Poorman & Poorman, 1988). I have 4 live collected specimens trawled in 33-82 m off the Golfo de Fonseca, El Salvador by Captain Xavier Mendoza, 6-8 October 1960.

78. *Calliostoma eximium* (Reeve, 1843). This species is known from the outer coast of Baja California, México to Ecuador (Keen, 1971). I collected a single live specimen aboard a shrimp trawler off Caelata La Cruz, Perú in 18 m, 13-15 April 1972 (Figure 1).

149. *Turbo squamiger* Reeve, 1843. This species is known from Bahía San Luis Gonzaga, Golfo de California to Paita, Perú (Keen, 1971) and Isla Gorgona, Colombia (Cosel, 1984). I have 4 small, live-taken specimens from Isla del Coco, Costa Rica from 3 dredge sites in depths of 15-61 m, 5 March 1984 and May 1985.

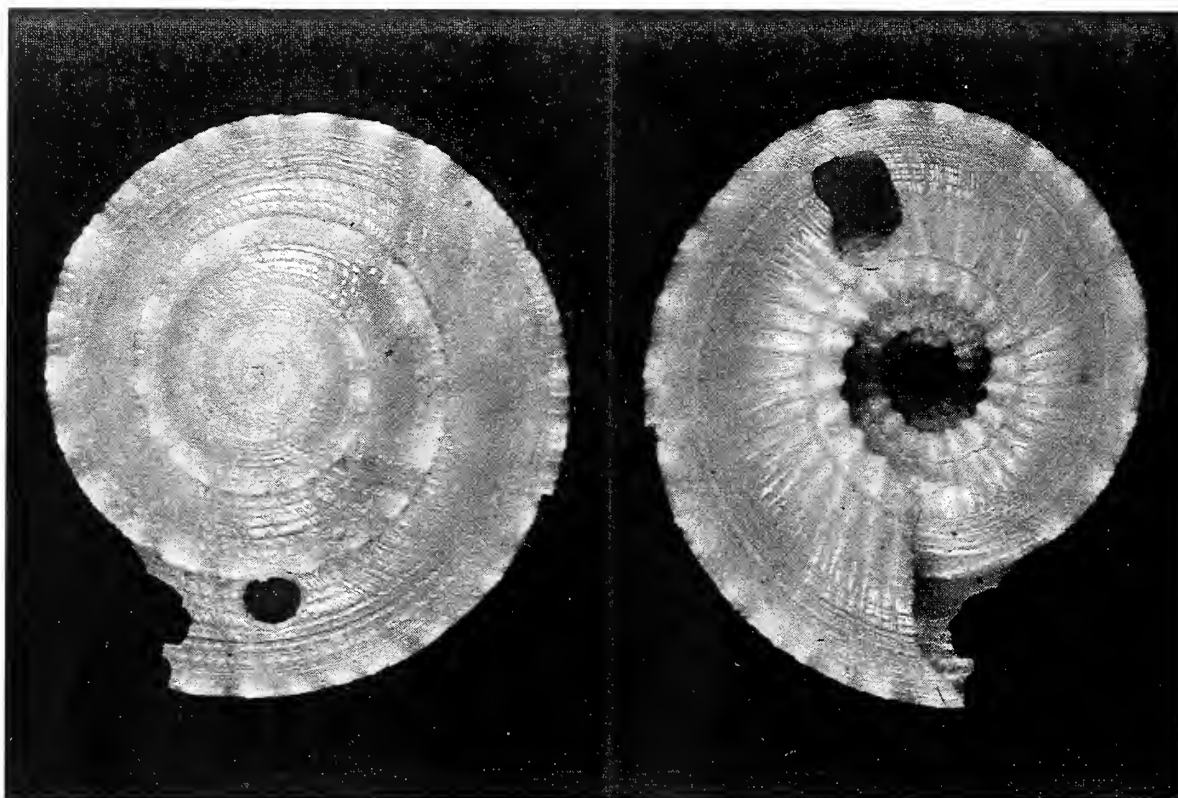
426. *Discotectonica placentalis* (Hinds, 1844). This species has been reported from Bahía Magdalena, Baja California to Guaymas, Sonora, México (Keen, 1971), Bahía de los Angeles, Golfo de California (J. Hertz,



Figure 1. *Calliostoma eximium* (Reeve, 1843), height 24.2 mm, width 26.1 mm. In 18 m off Caleta La Cruz, Perú by trawler *Maria Elena*. Leg. D.R. Shasky, 13 April 1972. Photos: D. K. Mulliner.

1977) and Isla Lobos, Perú (Alamo & Valdivieso, 1987). I have one specimen from each of the following localities: eastern tip of Bahía Ballena, Golfo de Nicoya, Costa Rica in 18-21 m, 16 March 1984; off Bahía Chatham, Isla del Coco, Costa Rica in 100 m, May 1986; near Caleta Tagus, Isla Isabela, Islas Galápagos, in 75-100 m, 24 June 1968, leg. Jacqueline de Roy (Figures 2, 3).

1093. *Trachypollia lugubris* (C.B. Adams, 1852). This species is known from Redondo Beach, California and south to Manabí Province, Ecuador (Radwin & D'Attilio, 1972), Isla del Malpelo, Colombia (Birkeland *et al.*, 1975) and Isla Gorgona, Colombia (Cosel, 1984). I have found this taxon at 3 dive sites in depths of 12-33 m and from 2 tangle net sites off Bahía



Figures 2, 3. *Discotectonica placentalis* (Hinds, 1844), height 4.5 mm, width 14.2 mm. In 75-100 m (2) spire view (3) basal view. Caleta Tagus, Isla Isabela, Islas Galápagos. Leg. J. de Roy, 24 January 1968. Photos: D. K. Mulliner.

Chatham, Isla del Coco, Costa Rica. All of the specimens are immature. I also collected 6 specimens intertidally, under rocks, at El Rubio, Perú, 16 April 1972.

1104. *Cantharus panamicus* (Hertlein & Strong, 1951). This species is known from Guaymas, Sonora, México to Panamá (Keen, 1971), and to south of Buenaventura, Colombia (Olsson, 1971). I have a single live collected specimen (Figures 4, 5) taken by Jacqueline de Roy from off Isla Santa Cruz, Islas Galápagos in 80 m, 28 May, 1967.

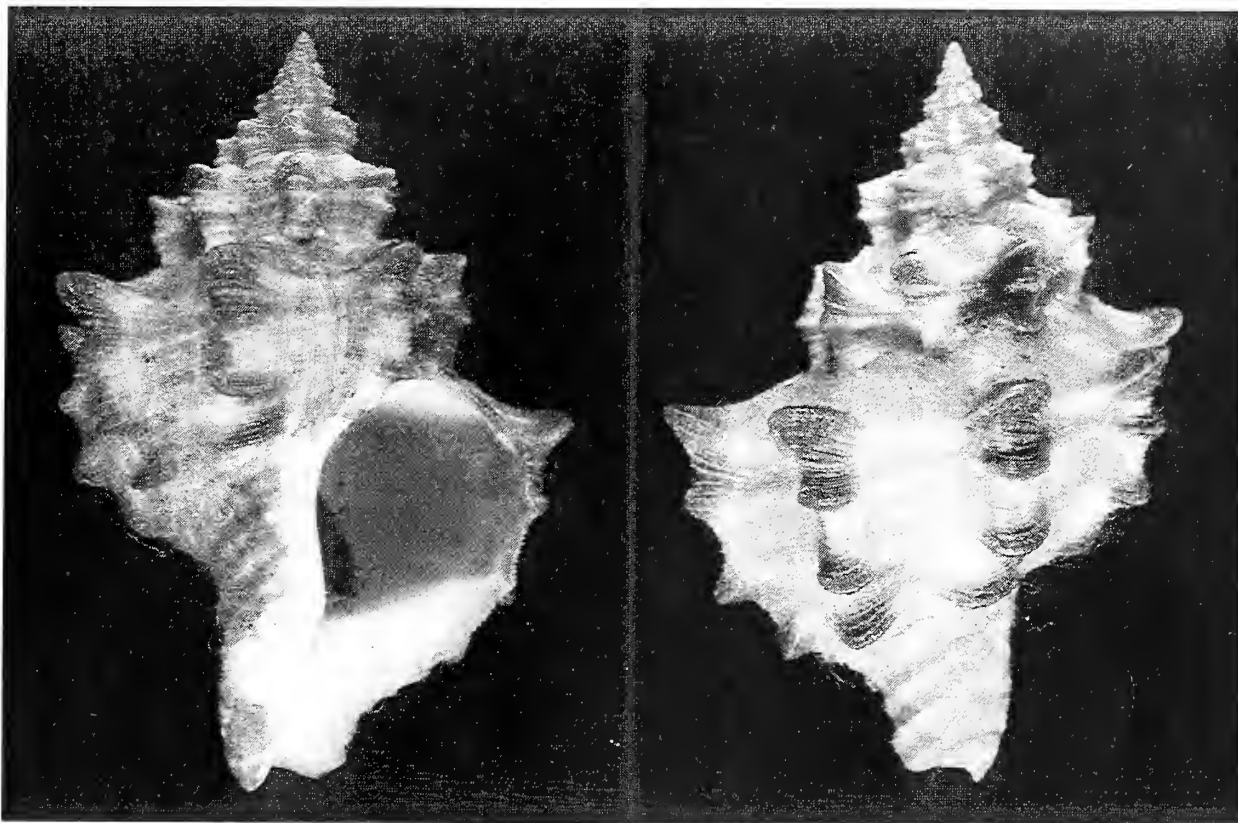
1110. *Cantharus janellii* (Kiener, 1835-36). This species is known from the Galápagos to Paita, Perú (Keen, 1971). I have a live taken specimen collected by Carmen Angermeyer from the South Canal, Isla Santa Cruz, Islas Galápagos that measures 34.1 mm (Figures 6, 7). Keen (1971) reports the specimen as "about 25 mm". My specimen is the only report of a specimen this large of which I am aware.

1246. *Nassarina vespera* Keen, 1971. This species has

been reported from Teacapán, Sinaloa, México to Port Parker, Costa Rica (Keen, 1971) and Manabí Province, Ecuador (Shasky, 1984). I collected a single specimen from 18-36 m while Jim McLean and I were aboard the shrimp trawler *Maria Elena* off Caelata La Cruz, Perú, 13-15 April 1972 (Figure 8).

1255. *Zanassarina conspicua* (C.B. Adams, 1852). Only the holotype from Panamá had been reported when I collected specimens at Manabí Province, Ecuador (Shasky, 1984). I also have a single specimen collected by Chuck Snell in 6 m at Sayulita, Nayarit, México, April 1971, 2 crabbed specimens I collected in 6 m at Caleta Tamarindo, Bahía Tenacatita, Jalisco, México, 25 February 1968 and 2 specimens in 7-9 m under rocks at Bahía Cuastecomate, Jalisco, México, 13-20 October 1968.

1260. *Zanassarina whitei* (Bartsch, 1928). This species has been reported from Guayaquil, Ecuador (Keen, 1971) and Nicaragua (Montoya, Lopez & Lopez, 1987) and 3 localities in Manabí Province, Ecuador (Shasky, 1984). I have also found a single specimen under a



Figures 4, 5. *Cantharus panamicus* (Hertlein & Strong, 1951), height 34.7 mm, width 24.0 mm (4) apertural view (5) dorsal view. In 80 m off Isla Santa Cruz, Islas Galápagos. Leg. J. de Roy, 28 May 1967. Photos: D. K. Mulliner.

rock at El Rubio, Perú, 16 April, 1972 (Figure 9).

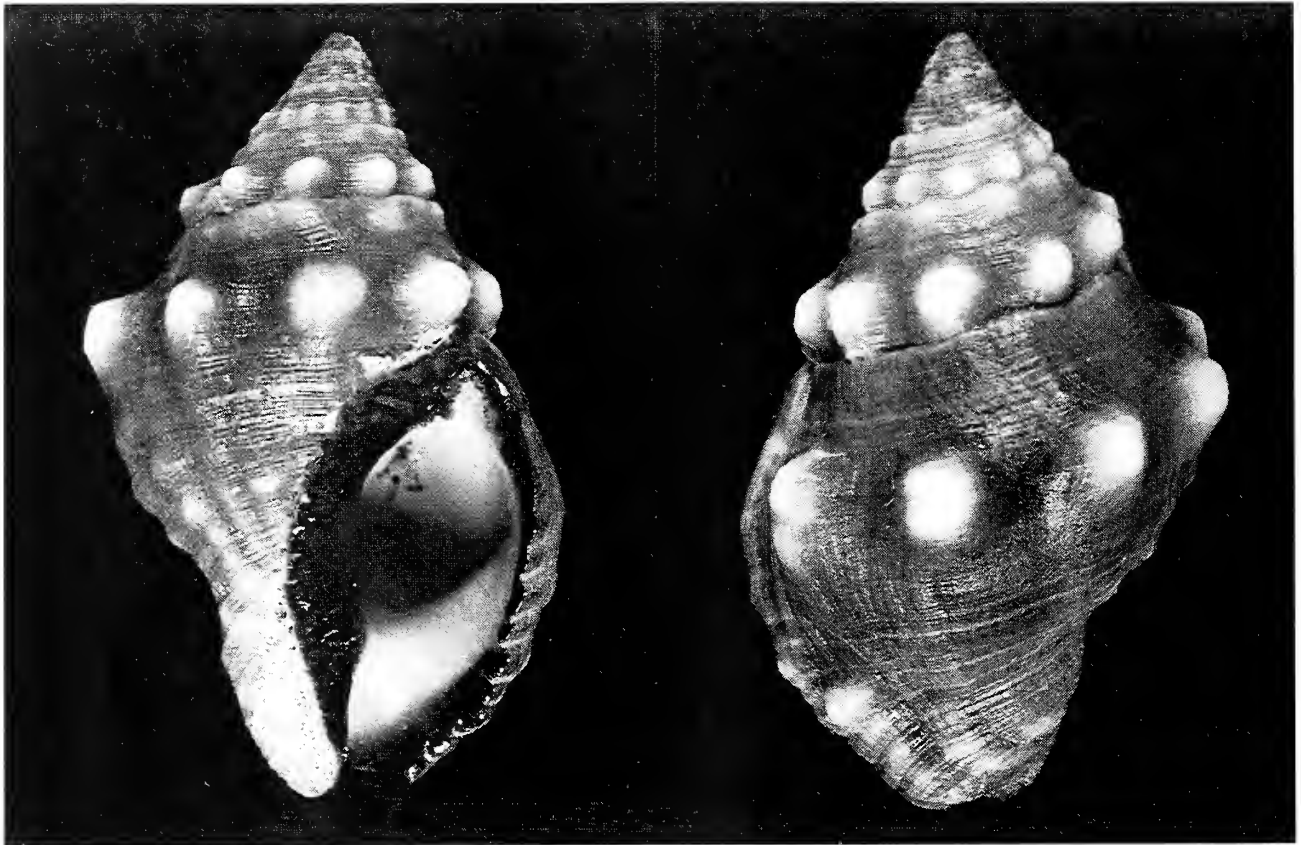
1295. *Nassarius nassiformis* (Lesson, 1842). This species is known from Guaymas, Sonora, México to Ecuador (Keen, 1971), Isla Gorgona, Colombia (Cantera *et al.*), the Galápagos (Shasky, 1989) and the Islas Revillagigedo (Emerson, 1995). It has not been reported from Isla del Coco, Costa Rica, where I collected 3 specimens at night on sand at Bahía Chatham in 17-27 m, 22 & 25 March 1984.

1307. *Nassarius nodicinctus* (A. Adams, 1852). Cernohorsky (1975) placed *N. angulicostis* Pilsbry & Lowe, 1932, in the synonymy of *N. nodicinctus*. The distribution is from the Golfo de California to Manabí Province, Ecuador. Previous records from the Galápagos were discredited by Nesbitt & Pitt (1986). From a depth of 97 m, 2 small specimens which were attached to coral came up in my tangle net from off Bahía Iglesias, Isla del Coco, Costa Rica, 4 April 1992.

1329. *Latirus hemphilli* Hertlein & Strong, 1951. This species is known from Bahía Magdalena, Baja California and Isla Carmen, Golfo de California to the Islas Perlas, Panamá (Keen, 1971) and Bahía San Carlos, Sonora, México (Poorman & Poorman, 1988). I collected 3 specimens aboard the shrimp trawler *Maria Elena* off Caelata La Cruz, Perú in 18-36 m, 13-15 April 1972.

1351. *Fusinus zacaе* Strong & Hertlein, 1935. This species was described from off Cabo San Lucas, Baja California Sur in 35-400 m. It has also been found off Bahía San Carlos, Sonora, México (Poorman, 1977). I collected a single specimen off Caelata La Cruz, Perú, while aboard the shrimp trawler *Maria Elena*, 13-15 April 1972. The shell measures 58.8 mm length, 22.4 mm width.

1415. *Gibberula polita* (Carpenter, 1857). This species is known from San Pedro, California through the Golfo



Figures 6, 7. *Cantharus janellii* (Kiener, 1835-1846), 34.1 mm height (6) apertural view (7) dorsal view. South Canal, Isla Santa Cruz, Islas Galápagos. Leg. C. Angermeyer. Photos: D. K. Mulliner.

de California to Costa Rica and possibly Panamá (Keen, 1971), Manabí Province, Ecuador (Shasky, 1984) and the Islas Galápagos (Finet, 1985). Several hundred specimens, most live taken, were collected both intertidally and by diving in depths from 12-38 m off Isla del Coco, Costa Rica, 1983-1989.

1454. *Cancellaria urceolata* Hinds, 1843. This species has been reported from the outer coast of Baja California, México to Cabo Pasado, Ecuador (Keen, 1971), Guayas, Ecuador (Skoglund, 1990b) and Bocapán, Perú (Alamo & Valdivieso, 1987). The Galapagan record (Finet, 1985) was deleted by Finet (1994b). I collected a single specimen while aboard a shrimp trawler off Caelata La Cruz, Perú, in 18-36 m, 13-15 April 1972.

1460. *Cancellaria indentata* Sowerby, 1832. This species is known from Bahía Santa Inez, Golfo de California to Cabo Pasado, Ecuador (Keen, 1971) and

Bahía San Carlos, Sonora, México (Poorman & Poorman, 1988). I have 2 specimens dredged from Isla Albemarle, Islas Galápagos from 25 m, 10 December 1935 (Figure 10). In addition I collected one dead specimen dredged by shrimp boat from 18-37 m from Caelata La Cruz, Perú, 13-15 April 1972.

1461. *Cancellaria jayana* Keen, 1958. This species is known from off Sonora, México to Panamá (Keen, 1971). I found a single specimen at Caelata La Cruz, Perú. (Collecting data as for #1454.)

1465. *Cancellaria balboae* Pilsbry, 1931. This species is known from off Bahía San Carlos, Sonora México (Poorman & Poorman, 1988) to Panamá (Keen, 1971) and to Guayas Province, Ecuador (Skoglund, 1990). I collected 5 specimens at Caelata La Cruz, Perú. (Collecting data as for #1454.)

1486. *Trigonostoma goniostoma* Sowerby, 1832. This



Figures 8 and 9. (8) *Nassarina vespera* Keen, 1971, height 6.5 mm, width 2.6 mm. Leg. D.R. Shasky on trawler *Maria Elena*, 13-15 April 1972. (9) *Zanassarina whitei* (Bartsch, 1928), height 7.2 mm, width 3.0 mm. Intertidally under a rock, El Rubio, Perú. Leg. D.R. Shasky, 16 April 1972. Photos: D. K. Mulliner.

species is known from the upper Golfo de California to Panamá (Keen, 1971). A single specimen was collected from Caelata La Cruz, Perú. (Collecting data same as #1454.)

1505. *Conus poormani* Berry, 1968. This species is known from depths of 55-70 m (Keen, 1971) and 100 m (Poorman & Poorman, 1988). One live specimen was trawled from 165 m (90 fm) off the west coast of Isla Espíritu Santo, Golfo de California, México, from the *Ariel* Expedition, 30 August 1960.

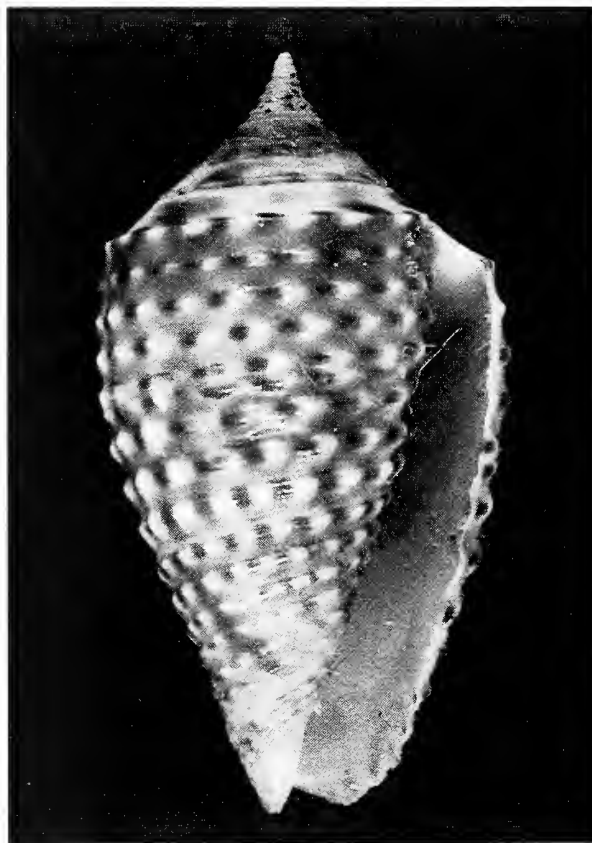
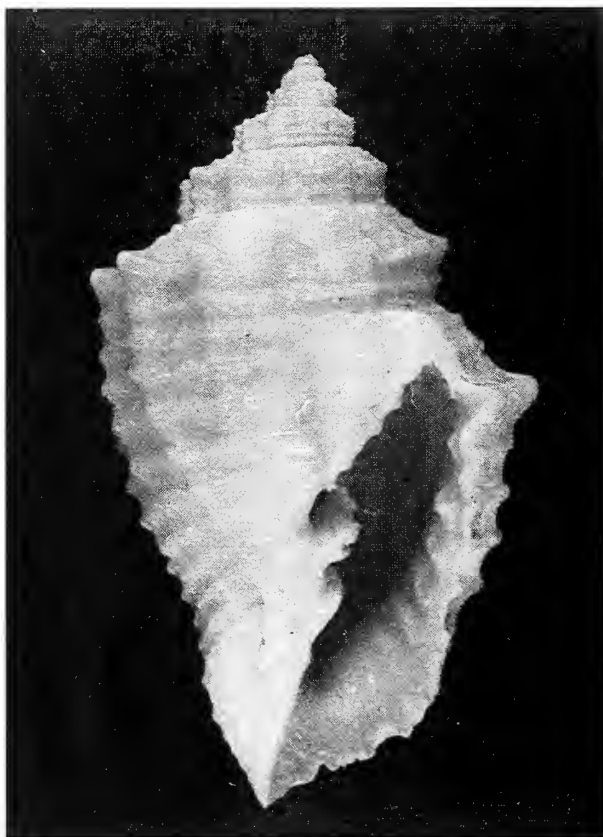
1515. *Conus perplexus* Sowerby, 1857. This species is known intertidally and to a depth of 37 m (Keen, 1971). Five live specimens were trawled in 36-73 m, three to five miles west of Mazatlán, Sinaloa, México, 24 October 1961.

---- *Conus baccatus* Sowerby, 1877. This species has

been reported only from the west coast of Panamá. One live specimen (Figure 11) was trawled from 10-30 m on shell substrate [station G-5], on the San Juan Expedition, Golfo de Tehuantepec, Oaxaca, México [15°30'N, 96°18'W], 15 July 1963.

1690. *Crassispira abdera* (Dall, 1919). This species is known from San Juan del Sur, Nicaragua to Santa Elena Peninsula, Ecuador (Keen, 1971). I dredged a single live specimen in 100 to 133 m off the east side of Roca Sucia, Isla del Coco, Costa Rica, April 1986.

1732. *Zonulispira zonulata* (Reeve, 1843). The known range of this species is from Mazatlán, Sinaloa, México to Bahía Panamá, Panamá (Keen, 1971). I collected 2 fine specimens intertidally under a rock at Punta Ancon, Ecuador, 7 March 1970. I am unable to determine whether or not these were live collected.



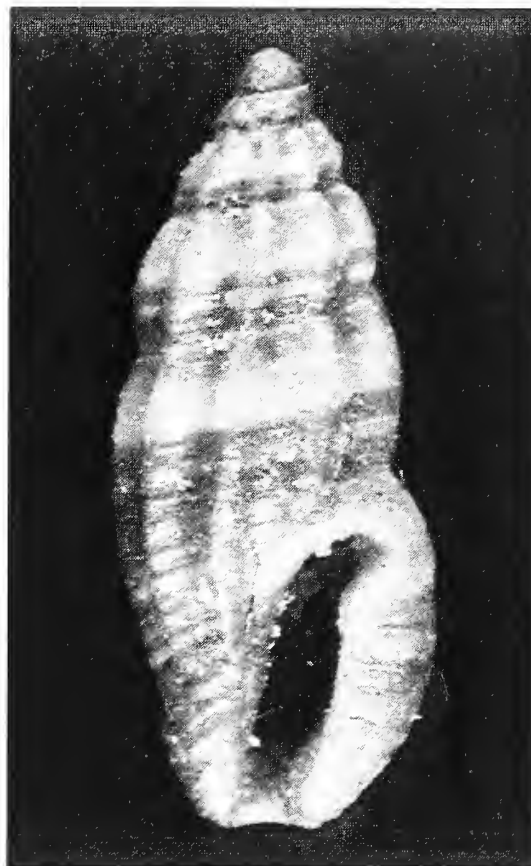
Figures 10 and 11. (10) *Cancellaria indentata* (Sowerby, 1832), height 32.0 mm, width 20.8 mm. In 18-37 m off Caleta La Cruz, Perú. Leg. D. R. Shasky on trawler *Maria Elena*, 13 April 1972. (11) *Conus baccatus* Sowerby, 1877, height 18.0 mm, width 9.6 mm. Trawled from 10-30 m on shell substrate on the San Juan Expedition, Golfo de Tehuantepec, Oaxaca, México, 15 July 1963. Photos: D. K. Mulliner.

1765. *Microdrillia tersa* Woodring, 1928. Woodring described this species from 7 specimens from the Miocene of Bowden, Jamaica. A specimen collected by the Alan Hancock Foundation was taken from 22 m in Bahía Panamá, Panamá. This was determined by Dr. James McLean. As far as I am able to tell this is the first and only report of this species in the eastern Pacific. I was fortunate to collect a specimen intertidally at Fort Amador, Panamá, 3 April 1981. My specimen is crabbed and decollate but shows the typical sculpture (Figure 12).

1798. *Tenaturris merita* (Hinds, 1843). This species is known from the head of the Golfo de California to the Santa Elena Peninsula, Ecuador (Keen, 1971) and Isla del Coco, Costa Rica (Shasky, 1996). I found a single dead specimen intertidally, in siftings, at El Rubio, Perú, 16 April 1972.

1800. *Notocytharella striosa* (C.B. Adams, 1852). This species is known from Bahía Concepción, Baja California, México, to the Santa Elena Peninsula, Ecuador (Keen, 1971). I have one specimen from under a rock at El Rubio, Perú.

1820. *Agathotoma quadriseriata* (Dall, 1919). In Keen (1971), Dr. James McLean makes the following statement regarding this species, "Originally said to range from the Gulf of California to Acapulco, Mexico; however, the Acapulco specimens have not since been detected. The type specimen and all others known are from localities (mostly unspecified) in the Gulf of California; the only verified locality is Bahía Concepción (LACM collection)." I have 2 specimens from siftings in 8 to 9 m, from Bahía Saladita, near Guaymas, Sonora, México. I also have 2 additional specimens from 5 to 9 m off La Cruz de Huanacastle,



Figures 12 and 13. (12) *Microdrillia tersa* Woodring, 1928, height 5.7 mm, width 2.1 mm. Intertidally, crabbed, Fort Amador, Panamá. Leg. D. R. Shasky, 3 April 1981. (13) *Agathotoma quadriseriata* (Dall, 1919), height 4.1 mm, width 1.7 mm. La Cruz de Huanacastle, Nayarit, México in 5-9 m. Leg. D. R. Shasky, 12 October 1973. Photos: D. K. Mulliner.

Nayarit, México, 12 October 1973, all collected dead (Figure 13).

ACKNOWLEDGMENTS

I wish to thank both Carol Skoglund and Carole Hertz for encouraging me to publish these records and Dave Mulliner for the photography.

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SEA GRANT EXOTIC SPECIES WEBSITE ANNOUNCED

The California Sea Grant Extension Program Newsletter (Jan-Feb.1997) announced a website by the Great Lakes Sea Grant Network for "science-based information on zebra mussels and other nonindigenous species." Though much of the information available at this time is related to the zebra mussel, information on other exotic species is being added regularly.

The Sea Grant Zebra Mussel and Nonindigenous Species World Wide Web site (sgnis), which can be

accessed through the World Wide Web, Telnet or directly through a modem, contains a comprehensive collection of research publications and educational materials produced by Sea Grant programs. The address is <http://www.ansc.purdue.edu/sgnis/>.

A CD-ROM version will be available soon for users who do not have Internet access.

For further information contact on the web site, contact Al Miller at (608) 262-0644.

A LATE PLEISTOCENE *CYPRAEA* (*MACROCYPRAEA*) *CERVINETTA*

NANCY SCHNEIDER

12829 Carriage Road, Poway, California, 92064, USA

On a recent trip to Baja California, México, my husband and I examined the Mulege Terrace which is exposed near Punta Gallito, six km south of the pueblo of Mulegé, Baja California Sur. The Mulege Formation is designated as late Pleistocene in age, about 124,000 years old.

Punta Gallito has been designated the type section of the Mulege Formation. There we found a completely formed fossil *Cypraea* (*Macrocypraea*) *cervinetta* Kiener, 1843, 73.1 mm L x 33.8 mm W x 27.6 mm H (Figures 1 and 2).

The fossil fauna of the Mulege Formation exposed at Punta Gallito indicate an intertidal sandy substrate near a rocky area. The eroded sediments on Mulege

Terrace reveal numerous fossil mollusks. This is the first time we have seen any evidence of *Cypraea* (*Macrocypraea*) *cervinetta* nor has it been reported from Baja California (Ashby & Minch, 1987; Durham, 1950).

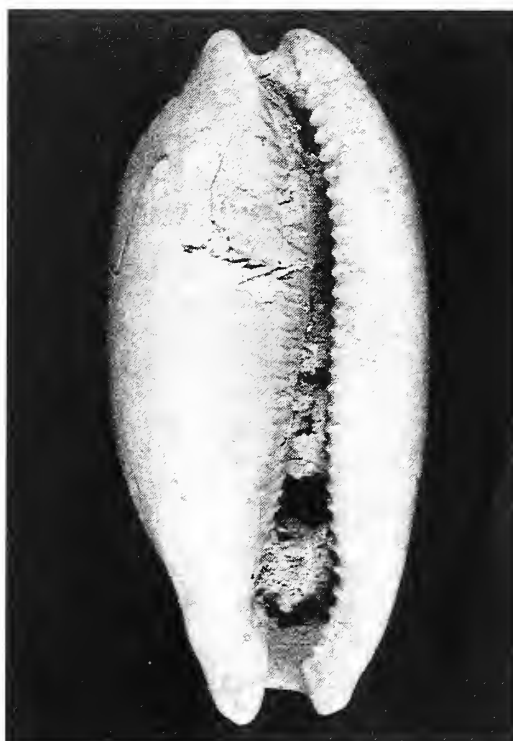
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Figures 1 and 2. *Cypraea* (*Macrocypraea*) *cervinetta* Kiener, 1843. (1) dorsal and (2) apertural views of specimen 73.1 mm L, 33.8 mm W and 27.6 mm H from the Mulege Formation. Photos: D.K. Mulliner.

BOOK NEWS

Shells and Shellfish of the Pacific Northwest

By: Rick M. Harbo

Color Photography by the author and others

Published by: Harbour Publishing, Madeira Park, B.C., Canada

270+ pages

Price: \$24.95

This book is a field guide to the common mollusks of the Pacific Northwest. The book contains an extensive introduction and a color photo of each animal. There are 225 common bivalves, gastropods, chitons and scaphopods pictured and described here. Each class is described in detail and includes a good deal of natural history about each animal. It contains sections on how to collect shells, what mollusks are edible, where to find specimens and a nice section on conservation and beach etiquette called "Working with Nature."

The book is further divided into sections on the four classes of mollusks covered. Each animal is described with common and scientific names, size, range, habitat, description and comments, which contain much natural history data. The emphasis here is on identifying the live animals as they are seen in the wild. It fills a need for color photographs of live shellfish rather than just illustrations of their shells. Few photos are taken of dead shells. A unique section of the book is devoted to "Eyes Looking Out" which describes the siphon "shows" of some of the common buried bivalves. For example, this section describes the differences between a geoduck show and a horseclam show, which is important if you're digging geoducks.

The book also contains a checklist of the animals in the book, an extensive glossary of molluscan terms and a glossary of the approximate meanings of the scientific names (which I found interesting and valuable), an index, a list of further reading and a section on harvesting regulations and red tide (paralytic shellfish poisoning) information and hotlines.

I was pleased to see the color photos of the live animals in this guide book. So often we are locked into a vision of a mollusk as just its shell. Live animal parts do not preserve particularly well and sometimes we forget these animals are more than their shells. We learn in this book that many snails have colorful bodies as well as interesting and attractive shells, such as *Velutina prolongata*. The siphons of buried bivalves can

have distinctive "shows" on the surface of the substrate that can be identified without digging up the animal. The body parts of some chitons such as *Placiphorella* can be related to their natural history. These are all reasons why soft body parts of mollusks are just as important as their shells, and many are well illustrated in this book.

The nomenclature used in the book is up-to-date with many malacological experts having been consulted. This is the first field guide book I've seen that has included four West Coast *Mytilus* species with an attempt to separate them (*M. californianus*, *M. edulis*, *M. galloprovincialis*, *M. trossulus*), although Harbo admits the latter three can't be divided by shell characteristics alone.

I particularly enjoyed Harbo's notes in the comments section on each animal. We learn here that *Nutricula* means "little nurse" and refers to the fact that the female of this bivalve species broods its young in the mantle cavity. We learn that although the gumboot chiton (*Cryptochiton stelleri*) has an appearance of a "wandering meatloaf"(!) and was frequently eaten by Native Americans, the actual quality of its flesh is closely related to its common name. And we learn that the sand collar egg case of *Euspira pallida* (= *Natica clausa*) has tiny protuberances on it that distinguish it from that of its larger cousin, Lewis's moonsnail (*Polinices lewisii*).

Harbo is a senior marine biologist with the Canadian Department of Fisheries and Oceans in Nanaimo on Vancouver Island. He is an avid diver and underwater photographer. Most of the 225 species illustrated are his own photos. Harbo is also the author of *Tidepool and Reef*, *The Edible Seashore*, and *Guide to the Western Seashore*.

This book will be a valuable addition to the library of Pacific Northwest scuba divers, shell collectors, beachcombers and malacologists.

Roland C. Anderson

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THE FESTIVUS

A publication of the San Diego Shell Club

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LIBRARIES

PROGRAM

Underwater in Papua New Guinea

Bob Brace, Professor of Reproductive Medicine at UCSD, has been diving for over twenty years as a hobby. He will share slides of his dives in Papua New Guinea.

Meeting date: 17 July 1997
Shells of the month: shells of New Guinea

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CLUB NEWS

From the Minutes of the San Diego Shell Club Meeting - June 19, 1997

In the absence of Terry Arnold, Vice President Wes Farmer called the meeting to order at 7:40 p.m. The minutes of the May meeting were approved as published in *The Festivus*.

Don Shasky, who had traveled to Cocos Island with Marc Chamberlain, introduced the distinguished speaker for the evening, who has won underwater photography awards for seven years in a row. Instead of the scheduled topic, Marc talked about the Maldive Islands in the Indian Ocean. It is a Muslim country and the livelihood of most of the people is fishing. There is a lush reef system comparable to the Great Barrier Reef. The ocean waters are clear with great visibility revealing 100 to 130 species of hard corals. Marc showed many great slides of schools of colorful fish, shrimp, sea urchins, anemones and other invertebrates. Like many other locations, the nesting areas of sea turtles are being destroyed.

After this informative presentation, Carole Hertz led the mini book auction of three out-of-print books. Margaret Mulliner announced the sale of the reprints priced at \$.25 each and an assortment of plastic boxes priced at \$.05 to \$.25 at the tables in the back of the room. Bill Romer announced that a host is still needed. There were no volunteers.

The winner of the drawing was Paula Barton. The meeting was adjourned at 8:45 p.m. for socializing, refreshments and looking over library books and reprints.

Silvana Vollero

A Date for the September Party

The Club's annual September party will be held on Saturday evening, September 20th at the home of Marty and Terry Arnold. This is the third year in a row that the Arnolds have hosted this affair and the Club is grateful for their generosity. Further details later.

The San Diego Shell Club Now Has a Web Page

Thanks to the efforts of members Bret Raines and Kim Hutsell, the San Diego Shell Club is now on the World Wide Web. Although the site is still under construction, there is considerable information about the Club (history, membership, meeting time and place, annual events and *The Festivus*). Information on *The Festivus* (subscription rates, back issues and supplements) is available. The website has convenient "links" with other clubs and organizations. Take a look.

The address for the San Diego Shell Club page (website) is: [www.molluscs.net/San DiegoShell Club/](http://www.molluscs.net/San_DiegoShell_Club/)

Additions and Changes to the Roster

New member

Joffe, Anne, 1157 Periwinkle Way, Sanibel Island, FL 33957, Phone: (813) 472-6991, FAX: 813-472-3153

Correction and Addition:

Trego, Kent D. Change from Kent B. Trego.

Skoglund, Carol & Paul. Add email address: carolskoglund@msn.com

International Abalone Symposium Announced

The third International Abalone Symposium will be held in Monterey at the Asilomar Conference Center on 26-31 October 1997. This conference is sponsored by California Sea Grant and will be attended by experts from around the world who will give papers and discuss topics such as abalone aquaculture, ecology, fishery management, economics and pathology.

There will be field and dive trips, video sessions and trade show events connected to the Symposium.

For further information contact Catherine Ashley, California Sea Grant, 9500 Gilman Dr., La Jolla, CA 92093-0232 or email cashley@ucsd.edu

REPORT OF A SECOND LIVE-COLLECTED SPECIMEN OF
CINCLIDOTYPHIS MYRAE DUSHANE, 1969,
AND ILLUSTRATION OF ITS OPERCULUM

CAROLE M. HERTZ¹

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2559 Puesta del Sol Road, Santa Barbara, California 93105, USA

Following the publishing of my article on *Cinclidotyphis myrae* in the January issue of *The Festivus* (Hertz, 1997) I discovered that I had erroneously reported that a live-collected specimen of *C. myrae* had never been found. Actually, the radula of a specimen (LACM 70-4) was figured in Radwin & D'Attilio, 1976, and by D'Attilio & Hertz, 1988!

In early April Billee Brown, a longtime collector and member of the San Diego Shell Club, in response to that article, told me that she had collected five specimens of *C. myrae* and that one juvenile specimen in the lot was live collected (Figure 1). This specimen measures 5.6 mm in height. The animal had been removed and the translucent yellow operculum mounted on cotton. The exterior view of the operculum is shown in Figure 2. Typhidae specimens have a muricine operculum with a basal nucleus, as seen in the Brown specimen, with a series of arched concentric lines from the posterior to anterior end (see D'Attilio & Hertz, 1988, p. 44, fig. 37c). These arched concentric lines are just visible on this enlarged photo of the operculum of this juvenile specimen.

Additional searching by Billee brought to light another lot of three specimens collected by her sister, Twila Bratcher-Critchlow, all collected dead, one a 19.3 mm specimen (Figure 3) just 0.7 mm short of the 20.0 mm record-sized specimen in the Carol Skoglund Collection (Radwin & D'Attilio, 1976, pl. 30, fig. 4). All the specimens, but the Skoglund specimen from Bahía de los Angeles, Jalisco, were taken intertidally in the area around Sayulita, Nayarit, México. A letter from Tom Rice of Port Gamble, Washington, following my article, noted a specimen he had collected empty at



Figure 1. *Cinclidotyphis myrae* DuShane, 1969, dorsal view of a live collected 5.6 mm specimen from Sayulita, Nayarit, México, in 1970. Leg. Billee Brown. Photo: D. K. Mulliner.

Sayulita and I also collected two more empty shells at Sayulita in February of this year. This brings the total

¹Mailing address: 3883 Mt. Blackburn Ave., San Diego, CA 92111, USA

number of reported specimens to twenty-one.

My thanks to Billee Brown for making me aware of the specimens in her collection and those of her sister, Twila, and for making the specimens available to me for study and photography. My appreciation, also, to Dave Mulliner for the excruciating work of photographing the minute operculum and the two specimens.



Figure 2. Operculum of specimen illustrated in Figure 1. Note arched concentric lines from posterior to anterior. Photo: D. K. Mulliner.



Figure 3. *Cinclidotyphis myrae*, dorsal view of a 19.3 mm specimen in the Twila Bratcher-Critchlow Collection. Photo: D. K. Mulliner.

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BAHÍA DE BANDERAS' SECRET

MICHAEL SMALL

177 James St., Ottawa, Ontario K1R 5M6, Canada

Puerto Vallarta is famous for many things: for its spectacular setting along the arc of Bahía de Banderas, a deep bight in the coastline of western Mexico; for the whales which sound offshore in the winter months; for the bellfry which falls off the old church every time there is an earthquake (which is often); and for the North American male tourists, who hide from daylight in the town's various sports bars, watching the same games they could see at home, swilling the same beer they could swill at home, and on the whole wishing they were at home, while their girlfriends and wives dally with time-share salesmen on the malecón. It is a tourist trap with a soul: big enough to cater to every transient's needs, yet small enough to remind you of the sleepy Mexican fishing port it once was. My favorite symbol of the place is Jorge - the one winged brown pelican, who politely queues up for his daily feed with the other customers at the fish market, under the mango trees, down by the beach.

For two years running, during New Year's week of 1995 and 1996, my wife Denise and I had the opportunity to stay with Kirstie Kaiser and Joe Johnston in their beautiful home in Puerto Vallarta. Kirstie, known to most readers of *The Festivus* for her contributions to Panamic malacology, is better known in Puerto Vallarta as an interior decorator who is training a generation of Mexican craftsmen to wrought nautilus designs into the backs of patio chairs and sculpt *Strombus*-shaped light fixtures out of adobe.

As it turned out, I was the first diver/collector friend of Kirstie's to roll up at her door in Puerto Vallarta, so it fell to the two of us to begin exploring the collecting sites around Bahía de Banderas. The bay is the dividing line not only between two Mexican states, Jalisco and Nayarit, but also between two time zones (Central and Mountain) and two climates - dry and arid along the flat north coast, and humid and wet along the mountainous south coast. From a strategically placed telescope on Kirstie's patio, on a mountain side overlooking the bay, we surveyed potential dive sights (Figure 1).

The first site which caught our eye was Los Arcos,



Figure 1. Map of Bahía de Banderas, not to scale.

a trio of pinnacles that juts out from the shore just before the popular beach of Mismaloya on the south coast. Every morning a fleet of pleasure craft would steam their way across our line of sight from the marina to Los Arcos, drop off throngs of tourists for short bursts of snorkelling and longer bursts of partying, and then steam back to the marina in the mid afternoon. We resolved to get there early.

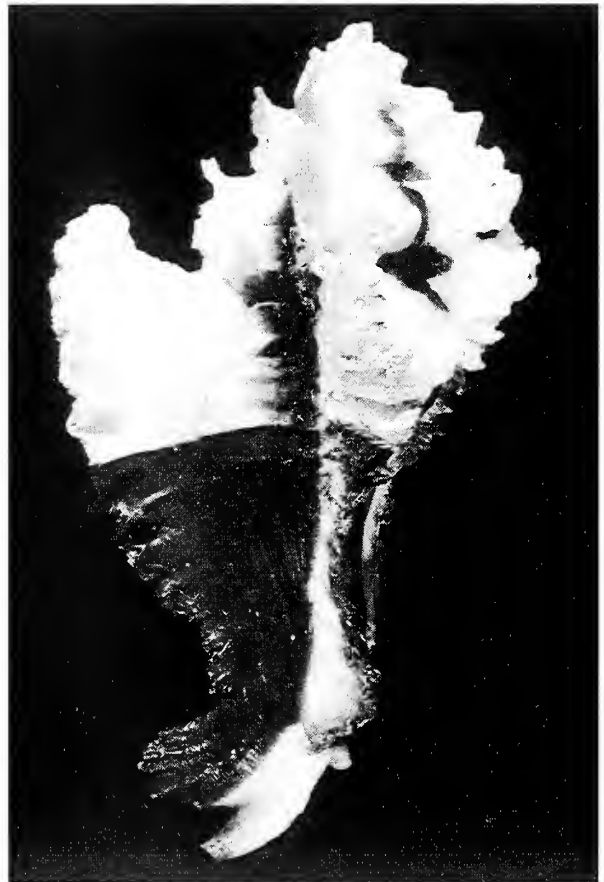
Since we did not have our own boat, our strategy was to find a panga for hire - that ubiquitous form of dive transport in México, owned and operated by pangeros who hang out around the more popular beaches. We drove down to Mismaloya and bargained ineffectually with a pangero named Pedro. (He had just returned from a week of skiing at Kirstie's former home of Park City, Utah. Given his prices, we probably helped fund the airfare for his next ski holiday.) Pedro zoomed us over to Los Arcos and we dove off the north

side of the islands, called poetically "el Bajo del Cristo."

Under water, the terrain was a gentle rolling slope with pinnacles rising up from fifty to about twenty feet, surrounded by many small smooth stones. However, there was plenty to turn - and five minutes into the dive, I turned a rock and a frilly shape rolled into a crevice below, which I immediately recognized as a *Pterynotus pinniger* (Broderip, 1833). I succeeded in retrieving the shell; and once I got it home and cleaned it, it displayed the spectacular, half white/half chocolate coloring which occasionally occurs on these shells (Figures 2 and 3). It was a great first find for Puerto Vallarta.

The second site we surveyed was Las Islas Marietas, two flat, table-top shaped islands at the mouth

of Bahía de Banderas. The dive shops in town will take you there by boat in ninety minutes; but we elected to drive to the northern tip of the bay at Punta Mita and take a quick twenty minute boat ride from there. We checked out two sites on the landward side of each of the islands. Overall, the collecting was not particularly impressive - steep boulders sloping down to a flat expanse of gravelly sand, and relatively little to turn. The mollusks we found were mostly the normal rock dwelling species e.g. *Conus princeps* Linnaeus, 1758, *C. diadema* Sowerby, 1834, and *Opeatostoma pseudodon* (Burrow, 1815). More interesting were several dead, but in good condition, *Cassis coarctata* (Sowerby, 1825) on the sand. I have since learned that these shells like exactly the type of sand/rock interface found at the bottom of the slopes around these islands.



Figures 2 and 3. *Pterynotus pinniger* (Broderip, 1833). Length: 61.7 mm, Los Arcos, Bahía de Banderas, Jalisco, México. Leg. Michael Small, January 1995. (2) apertural view (3) dorsal view. Photos: D.K. Mulliner.

Finally, Kirstie found a *Chicoreus regius* (Swainson, 1821), which is close to the north end of its recorded range at Puerto Vallarta.

In January 1996, we returned and found the water around the island full of hovering manta rays, which could be seen clearly over the side of the boat. Pairs of humpback whales were also breaching in the waters around the islands. The water was cool - around 75°F, and we had to cut short the dive since we were not well dressed for it. However, the dredging on the gravel bottoms, between 100 and 200 feet between the islands, has proved to be more productive. We found *Conus archon* Broderip, 1833, *Harpa crenata* Swainson, 1822, and the pretty ribbed *Strombina bonita* Strong & Hertlein, 1937. Our most interesting find was *Cantharus berryi* McLean, 1970, (Figure 4) which according to Keen is only recorded from Bahía de Banderas. Overall I would skip Las Tres Marietas as a dive site for shells and would concentrate on dredging - or just whale watching.

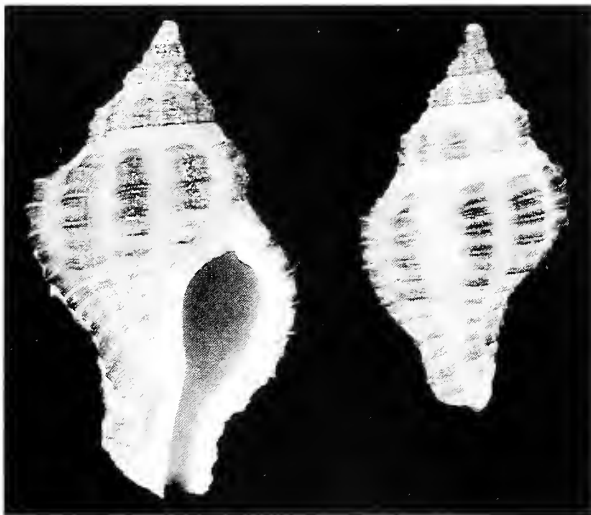


Figure 4. *Cantharus berryi* McLean, 1970. Islas Marietas, Bahía de Banderas, Nayarit. Leg. Michael Small, January 1996. Left: length 19.9 mm, right: length 16.1 mm. Photo: D. K. Mulliner.

Punta Mita itself offers some easily accessible intertidal collecting. To the right of the main beach, beyond the pangas and palapa huts, is a stretch of reef covered in turnable stones which partially dries at low tide. This spot is the only place I have ever found a *Cypraea isabellamexicana* Stearns, 1893, by turning

rocks at low tide. And when you tire of rock turning, you can retire to the palapa huts, order a cold Pacifico, and simply admire the view of the bay.

My wife Denise did just that one New Year's Day, while Kirstie and I set out in search of our regular pangero, Ramón, to take us dredging - but, alas, he had been felled by the festivities of the night before. We had no luck finding a pangero so we finally gave up and joined Denise under the palapa huts, to do what everyone else in Puerto Vallarta was doing that day.

Our most memorable dive off Punta Mita was a night dive that never happened. I was determined to find a nice sheltered sandy bay with good mollusk life at night - and several attempts on the south side of the bay beyond Los Arcos had produced only silty bottoms. So, I persuaded Kirstie we should try diving off the beach in front of the palapa huts. At that time, the pangas were obliged to embark around the point (they have since relocated inside Punta Mita). It took us an hour to drive out to the point, another forty minutes to find and negotiate with the pangero; then another hour to drive back into town; followed by another hour drive out to the point. In the interval, our pangero had refueled both his boat and himself and was quite looking forward to the trip. We crashed through the high surf and headed out in the darkness into the open sea, Kirstie and I clutching onto the sides of the boat to prevent being tossed overboard, while our pangero took quick nips out of his tequila bottle and let forth various "gritos" to keep up his spirits (literally). Kirstie thought we were going to die; I was not much more optimistic. We finally made it around the point into calmer waters and anchored about 200 meters off-shore. Kirstie and I dove overboard and hit the bottom - where the visibility was so poor, we had to touch each other's masks to confirm contact. We immediately surfaced, checked another spot, and found the same conditions. Another restful ride back around the point, followed by an hour drive home concluded my last ever night dive in Puerto Vallarta.

Kirstie and I finally hit upon our favorite site toward the end of our first week of collecting in 1995; and it was confirmed again in 1996. The spot is called Mahauitas, and it is on the south side of Bahía de Banderas, 15 minutes by panga west from Mismaloya, just before the well-known tourist spot called Bahía John Huston (where the director once owned a small beach home). The terrain here is a 45 degree slope with cracks in the rock face, many large stones with some sand pockets underneath. The usual Panamic mollusks found on any rocky shoreline are found here. However,

there are some notable species. The muricid *Homalacantha oxyacantha* (Broderip, 1833) is quite plentiful, with its strange tubular spines; so is the little muricid which is endemic to this part of the Mexican coast, *Muricopsis jaliscoensis* Radwin & D'Attilio, 1970. The *Neorapana muricata* (Broderip, 1832) along this shoreline are the largest and brightest I have ever found - specimens over 80 mm are common. The *Cymatium gibbosum* (Broderip, 1833) here are large, inflated and beautifully tinged with pink. It is also the only place in which I have ever found the small *Cymatium lignarium* (Broderip, 1833) (Figure 5).

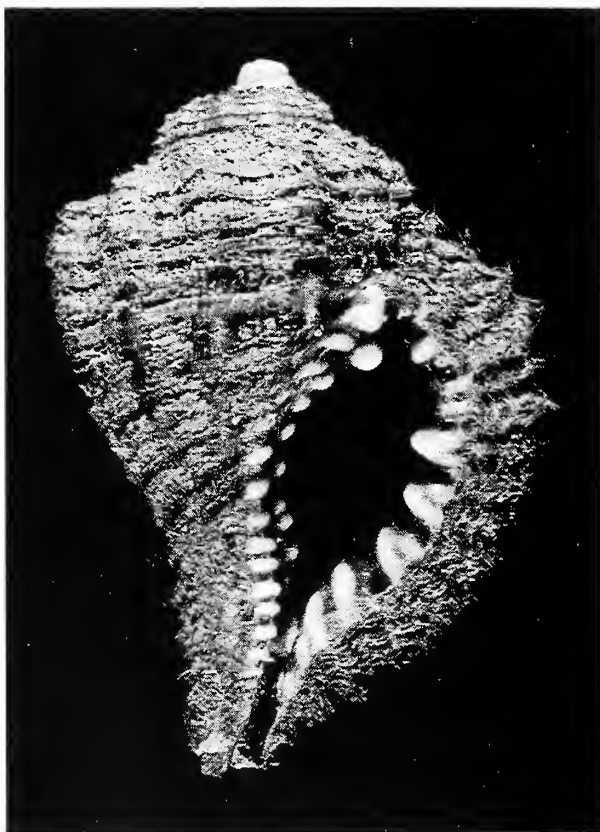


Figure 5. *Cymatium lignarium* (Broderip, 1833). Length: 23.8 mm, Mahauitas, Bahía de Banderas, Jalisco. Leg. Michael Small, January 1996. Photo: D. K. Mulliner.

Morum tuberculosum (Reeve, 1842, ex Sowerby MS) with their strange green and gold flecked mantle are common in the sand pockets under the stones. We have

also found specimens of both Panamic shallow water volutes, *Enaeta barnesii* (Gray, 1825) and *E. cumingii* (Broderip, 1832).

However, the prize find to date in our collecting came on my last morning dive at Mahauitas, when I picked up a stone on top of a deep sand pocket and found a live *Colubraria procera* (Sowerby, 1832) half buried underneath. Kirstie and I had suspected this rare Panamic mollusk might live in Bahía de Banderas - since the type locality is from Manzanillo about two hours drive south, and Kirstie had found what looked like a juvenile there the year before. However, there in living technicolor before me was a large, live, adult specimen. Furthermore, having read "Shasky's Secret" in *The Festivus*, written in reply to my article about this species (Small, 1995; Shasky, 1995), I knew what to do next. I swam over to Kirstie, who was a few feet away and beckoned her to watch as I fanned the sand gently in the pocket, to reveal a second, smaller specimen underneath. Both animals were a mottled medium brown on a white background; the shell has a yellow mouth, chocolate brown columella, and a steely gray-blue dorsum, flecked with dark brown. It is one of the most striking shells in the Panamic province - and finding a pair unlocked the secret for me of collecting in Puerto Vallarta.

ACKNOWLEDGMENTS

My sincere thanks to Kirstie Kaiser and her husband Joe Johnston for their generosity, their hospitality and above all their patience with my little obsessions. My thanks as well to Don Shasky for showing the way and, as always, needling me to keep up with him.

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GALE G. SPHON, 1934-1995,
AND HIS CONTRIBUTIONS TO MALACOLOGY

JAMES H. MCLEAN

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900 Exposition Blvd., Los Angeles, California 90007, USA

Gale G. Sphon, Jr. was associated with museum mollusk departments, first at the Santa Barbara Museum of Natural History, and later at the Los Angeles County Museum of Natural History, from which he retired in 1992. Gale was born in National City, California, 4 June 1934, to Katheryn and Gale G. Sphon, Sr. He died at the age of 61 at Lake Isabella, California on 12 May 1995. He is survived by his younger sister, Barbara L. Walker, of Lake Isabella, California.

Gale attended school in Long Beach, California, graduating from Long Beach Polytechnic High in 1952, followed by two years at Long Beach City College through 1954, and a B. A. in Botany from the University of California in 1957. While at UCLA, he first became associated with the Los Angeles County Museum of Natural History as a student worker in the Botany Department. From 1957 to 1959 he served in the U. S. Army, attaining the rank of Pfc.

Gale first became interested in mollusks in 1947, after his junior high school teacher Edith Rex introduced him to shells and to shell books. His first collecting experience was with the shells of Long Beach and Alamitos Bay. By 1955 he became active in the Conchological Club of Southern California and served as president in 1961. In 1960 he participated in the Ariel Expedition out of Guaymas, Sonora, in which club members hired a shrimp boat for shell dredging in the Gulf of California.

Gale's interest in mollusks was nurtured by Mrs. Faye Howard, of Santa Monica, who had moved from Santa Monica to Santa Barbara, where she became closely associated with the Santa Barbara Museum of Natural History. Faye sponsored Gale for a position in malacology at the Santa Barbara Museum, where he became staff malacologist from 1961 to 1968. During his first year at Santa Barbara, Gale accompanied Mrs. Howard on the eight week "Churea" expedition along the west coast of Mexico south to San Blas, Nayarit.

He was a founding member of the Santa Barbara



Gale G. Sphon in 1968, when he started at the LACMNH

Malacological Society, which published *The Tabulata* from 1963 to 1974. In 1967, Gale was president of the Pacific Division of the American Malacological Union and organized the annual meeting at Asilomar in Pacific

Grove, California.

In 1968, Gale moved back to the Los Angeles area and started in the new position as curatorial assistant in mollusks at the Los Angeles County Museum of Natural History, where he remained until his retirement in 1992. During this period the museum's mollusk collection experienced unprecedented growth, resulting from the consolidation of the Hancock Foundation collection and expedition material from many other sources. With curatorial expertise provided by Gale, usage of the collection grew rapidly and its expansion was supported by the National Science Foundation with three consecutive grants that ran from 1983 to 1993.

During this period Gale made several collecting trips to Bahía San Luis Gonzaga in the Gulf of California. In 1971 he joined the Ameripagos Expedition to the Galápagos Islands, an expedition organized by actively-publishing amateur collectors in Southern California.

During the periods of his two museum positions, Gale wrote papers on mollusks, particularly in his two areas of interest, nudibranchs and other opisthobranchs and the gastropod family Mitridae. Several papers related to his field work. His record of scientific publications extended from 1960 through 1978, during which time there were 16 scientific papers and four reports on type specimens. There were also 17 other articles. His most frequent collaborator was his good friend David Mulliner of San Diego, with whom he shared an interest in opisthobranchs. Five gastropod species were proposed by Gale, separately or with co-authors, and five mollusk species were named in his honor.

Gale was fond of Siamese cats and always had at least one of them at home. One story, of which there is a record in the nudibranch literature (1973, below), relates that his house guest, the noted opisthobranch worker Eveline Marcus, was so taken with his cat named Tanya, that she named *Doris tanya* E. Marcus, 1971, after her.

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Taxa proposed by Gale G. Sphon

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Thala jeancateae Sphon, 1969
Berthella kaniae Sphon, 1972
Platydoris carolynae Mulliner & Sphon, 1974
Subcancilla edithreae Sphon, 1976

Taxa named in honor of Gale G. Sphon

Lima (Plicacosta) sponi Hertlein, 1963
Olivella (Olivella) sponi Burch & Campbell, 1963
Mitra (Strigatella) sponi Shasky & Campbell, 1964
Felimedia sponi Marcus, 1971
Pseudosimnia (Pseudosimnia) sponi Cate, 1973

For dates of milestones and other information, I acknowledge an anonymous biographical sketch from the Hawaiian Shell News, 15(7): 5-6 (July, 1967) and the brief account in the late R. T. Abbott's second edition of *Register of American Malacologists* (1987: 128). Barbara Walker made several corrections.

BOOK NEWS: TWO NEW PUBLICATIONS ANNOUNCED

Checklist of the Marine Bivalves of the Northeastern Pacific Ocean

By: Eugene V. Coan & Paul H. Scott

Publisher: Santa Barbara Museum of Natural History.
 1997. Softcover, 28 pages, 12 line drawings
 Price: \$12.00 plus 7.75% tax (California only) and postage (\$3 per volume, US; \$5 per volume, non-US)

This publication, the first in a series of **Contributions in Science** by the Santa Barbara Museum of Natural History, "provides an inventory of marine bivalve mollusk taxa from the Arctic coast of Alaska to central Baja California, including all habitats from the intertidal to the deep-sea. Footnotes highlight taxonomic innovations included in the inventory."

The authors announce that all species treated in this checklist will be "fully treated" in their book on the marine bivalves of western North America to be published later this year (Coan et al., 1997).

To order, write to the Department of Invertebrate Zoology, Santa Barbara Museum of Natural History, 2559 Puesta del Sol Road, Santa Barbara, CA 93105, USA or FAX 805-569-3170.

Registry of World Record Size Shells

By: Kim C. Hutsell, Linda L. Hutsell, Donald L. Pisor
 Publisher: Snail's Pace Productions, San Diego, CA
 1997. Softcover w/ acetate sheet, spiral bound, 101 pp.
 Price: \$15.00 plus 7.75% tax (California) and handling.

This is the first issue of Hutsell & Pisor's Registry of World Record Size Shells. The new publication, planned to be published bi-annually, is formatted for ease in finding any of the over 4470 entries. Species are listed alphabetically by family, followed by genus, record size in millimeters, owner of the specimen, location collected, year collected and a literary reference.

Snail's Pace Productions obtained the rights to incorporate data from Wagner & Abbott's *World Size Records, Standard Catalog of Shells* along with data compiled for that publication by Barbara Haviland.

To order, contact Snail's Pace Publications, 5804 Lauretta St., San Diego, CA 92110-1670, USA or FAX (619) 294-3914 or E-mail khutsell@ix.netcom.com or to Pisor's Marine Shells, 646 N 30th St., San Diego, CA 92102, USA or E-mail d-jpisor@ix.netcom.com

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THE FESTIVUS

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The Festivus is published monthly except December. The publication date appears on the masthead above. Single copies of this issue: \$5.00 plus postage.

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Meeting date: third Thursday, 7:30 PM
Room 104, Casa Del Prado, Balboa Park

PROGRAM

My Recent Exciting Dive Trips

Fellow member and award winning underwater photographer, Bob Yin, will present a slide show of his latest underwater adventures.

Meeting date: 21 August 1997
Shells of the month: Philippine shells

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CLUB NEWS

Minutes of the San Diego Shell Club Meeting - July 17, 1997

Terry Arnold called the meeting to order at 7:45 p.m. The minutes of the June meeting were accepted as published in *The Festivus*. Guests Heidrun and Phil Faulconer and the speaker and his wife Cecelia were welcomed. Terry announced that the September party on September 20th will be a "munchie" party with hot and cold appetizers and desserts. Terry passed around the signup sheet. [See below.] With no other announcements, Wes introduced the speaker for the evening, Bob Brace, a professor at UCSD who has been a SCUBA diver since 1964. His presentation on Papua New Guinea began with a slide of a sunrise over a volcano. Despite the reputation of cannibalism on the big island, Bob said that the people were very friendly in the villages. Interestingly, native children have blond hair until about age 15. Bob's slides included quite a variety of colorful fish including the well-camouflaged crocodile fish. He reported that there are over 100 species of clownfish in the area. Also it was interesting to learn that fish with large eyes tend to be nocturnal. He also showed several kinds of large clams and a variety of unique sponges. Rope sponges can be found to be 30 to 40 feet long. Bob concluded his presentation with questions from the audience.

Terry won the door prize. The meeting was adjourned for socializing and refreshments brought in by the Regulas and Don Shasky.

Silvana Vollero

The September Party Come to Munchie Madness

The party, to be held on 20 September at the home of Marty and Terry Arnold, will this year have a different twist. It's to be a "munchie" party. Attendees will be asked to bring "heavy hors d'oeuvres and desserts" (hot and cold appetizers and finger foods or desserts) to be eaten in the hand and to serve twelve people. It was agreed that some of the most popular items at most parties are the foods you snap off the tray and nibble while enjoying the company of those attending. So this year the meal will consist of all these goodies. If you decide that you want to partake of the food, make sure to bring your share! As always, the

Club will provide the beverages -- soft drinks, wine and beer.

A sign up sheet will again be passed at the August meeting and those not in attendance will be called. A map will be sent out with the September issue. There will be no regular September meeting.

Sounds like great fun. Don't miss it!

Additions and Changes to the Roster

Hoepner, Gayle & Connie, 3631 Seaview Ave., Corona Del Mar, CA 92625, (714) 673-8528
Museum National d'Histoire Naturelle, 55 Rue de Buffon, 75005 Paris, France
Kronenberg, Gijs C. [Add E-mail address: gijsckro@worldonline.nl]

Club Library Videos

The Club encourages the circulation of its videos which may be borrowed for one month and must be received by the librarian no later than one month from the date circulated. A fee of \$3.00 is required to cover postage and handling as well as a check in deposit of \$25.00 which will be returned on receipt of the rewound tape. (Videos not received by the end of the circulation period will be considered lost and the deposit check will be cashed for replacement.)

All videos are circulated by the librarian. To arrange a video loan, contact librarian (Margaret Mulliner, 5283 Vickie Dr., San Diego, 92109, or call (619) 488-2701). A listing of available videos (in chronological order) follows:

Dredging in the Sea of Cortez (C. & P. Skoglund, Aug., 1990)

Honduras (D. Shasky, Nov. 1990)

Shell Cleaning Workshop (with K. Hutsell, Jan. 1991)

Abalone (D. Leighton, Oct. 1991)

Ammonites of the Western U.S. (E. Noble, Nov. 1991)

Exploring Baja (D.K. Mulliner, Feb. 1992)

Conservation of Marine Coastal Environments (D.B. Kent, Mar. 1992)

Abalone Reproduction (V. Vacquier, June 1993)

NEW PANAMIC PROVINCE DISTRIBUTIONAL RECORDS FOR THIRTEEN CHITON (POLYPLACOPHORA) SPECIES

CAROL SKOGLUND¹

Associate, Santa Barbara Museum of Natural History,
2559 Puesta del Sol Road, Santa Barbara, California 93105, USA

Many years of dredging and a longstanding interest in chitons have resulted in some interesting finds, 13 of which are new distributional records for their species. All specimens listed herein were collected by my husband Paul and me, except for one which is noted, and all are now in the Skoglund Collection.

Two of the species on this list are reported from the Golfo de California for the first time, and bring to three the number of Californian chiton species found at Bahía de los Angeles, Baja California, México. *Callistochiton palmulatus* Dall, 1879, ex Carpenter MS was reported earlier (Skoglund, 1997). Eleven other Californian mollusk species that are unknown elsewhere in the Gulf have been previously reported from the Bahía de los Angeles area (Skoglund, 1983, 1988, 1989, 1995, 1997).

Some confusion has existed in the literature over collecting done near Bahía San Carlos, north of Guaymas, Sonora, México. Roy and Forrest Poorman always referred to this area as their "deep hole" and cited it as "off Tetas de Cabras," a prominent local hill. Carl and Laura Shy dredged the same place but cited it as "off Punta San Antonio," which is the southern boundary of Bahía Algodones. I have chosen to use "off Punta San Antonio" for our own dredging and in this paper.

Family LEPIDOPLEURIDAE
Genus *Hanleyella* Sirenko, 1973

Hanleyella oldroydi (Dall, 1919). Previously known from Alaska to San Quintín, Baja California, México (Kaas & Van Belle, 1985). A single slightly

curled 4.4 mm specimen (Figure 1) was dredged off Isla Smith, Bahía de los Angeles, Baja California from 120 to 170 m. This is the first Panamic Province record for the species.

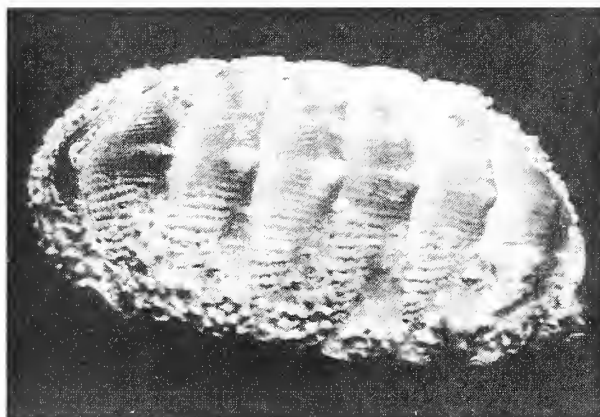


Figure 1. *Hanleyella oldroydi* (Dall, 1919). Off N.W. Isla Smith, Bahía de los Angeles, Baja California, México. Dredged 120 to 170 m. Curled length: 4.4 mm. Photo: P. Skoglund.

Family ISCHNOCHITONIDAE
Genus *Ischnochiton* Gray, 1847
Subgenus *Ischnoradsia* Shuttleworth, 1853

Ischnochiton (*I.*) *carolianus* Ferreira, 1984. Previously known from off Punta San Antonio, Sonora, and off Isla Smith, Bahía de los Angeles, Baja California, México (Ferreira, 1984). Extend distribution south along the coast of Baja California to off Isla Danzante, Golfo de California, México, where

¹Mailing address: 3846 E. Highland Ave., Phoenix, AZ 85018, USA. E-mail: carolskoglund@msn.com

a single specimen (Figure 2) was dredged at 120 m.



Figure 2. *Ischnochiton carolianus* Ferreira, 1984. Off N.E. Isla Danzante, Golfo de California, México. Dredged 60 to 120 m. Length: 6.3 mm. Photo: P. Skoglund.

Ischnochiton (I.) dispar (Sowerby in Broderip & Sowerby, 1832). Previously known from Nicaragua to Panamá (Kaas & Van Belle, 1990). Extend distribution south to Punta Jacinto, Salinas, Ecuador, where it was found on the undersides of rocks in the intertidal zone (Figure 3).

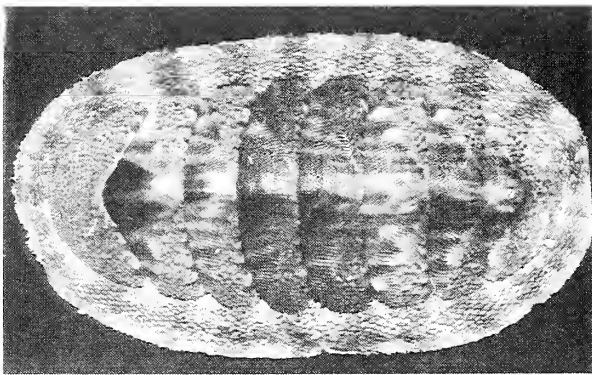


Figure 3. *Ischnochiton dispar* (Sowerby in Broderip & Sowerby, 1832). Punta Jacinto, Salinas, Ecuador. On underside of rock at low tide. Length: 13.6 mm. Photo: P. Skoglund.

Genus *Stenoplax* Dall, 1879, ex Carpenter MS
Subgenus *Stenoplax*

Stenoplax (S.) boogii (Haddon, 1886). Previously known from Bahía de los Angeles, Baja California, México, to Perú, with verified records from Cabo San Lucas at the tip of Baja California Sur, México, to Panamá (Ferreira, 1985b). Distribution to Bahía de los

Angeles, Baja California, México, confirmed by a single specimen (Figure 4) dredged from 20 to 40 m.

This specimen was identified by Ferreira in August 1985, and returned with the note saying it was the northernmost record for the species.

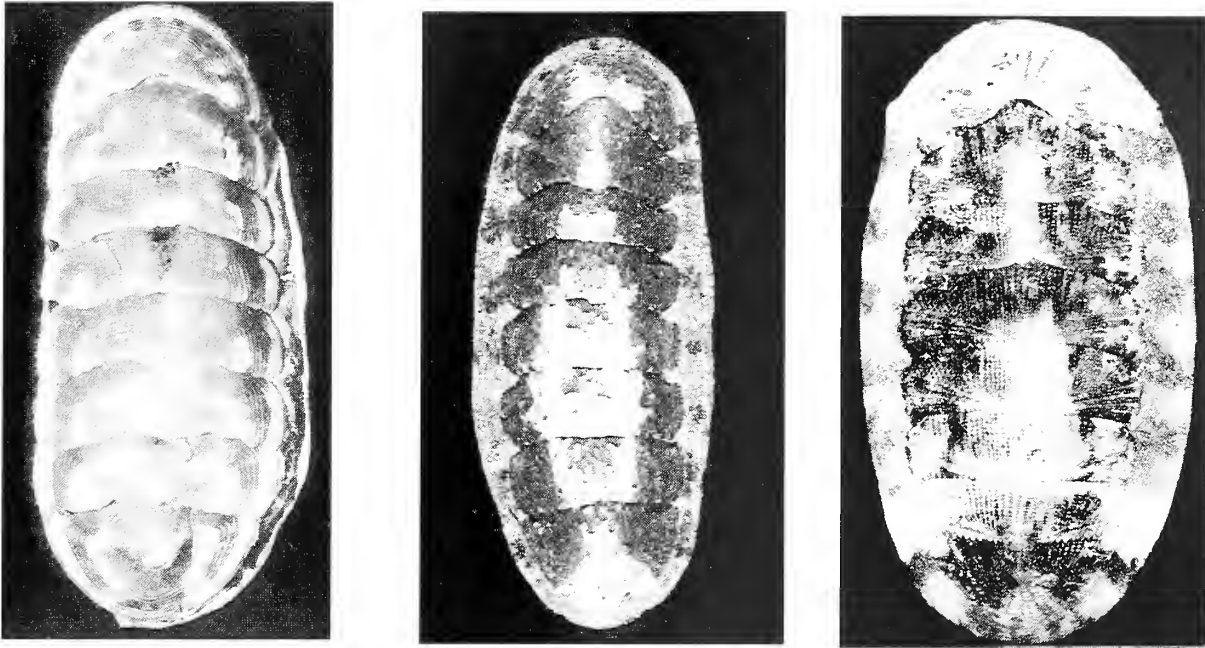
Stenoplax (S.) circumsenta Berry, 1956. Previously known from Laguna de Scammon to Bahía Magdalena on the Pacific side of Baja California; from Isla Monserrate to La Paz on the Gulf side; near Guaymas, Sonora, on the Mexican mainland (Kaas & Van Belle, 1987). Extend distribution north to Bahía de los Angeles, Baja California, México, both in the intertidal zone and dredged from 20 to 40 m (Figure 5).

Genus *Lepidozона* Pilsbry, 1892
Subgenus *Lepidozона*

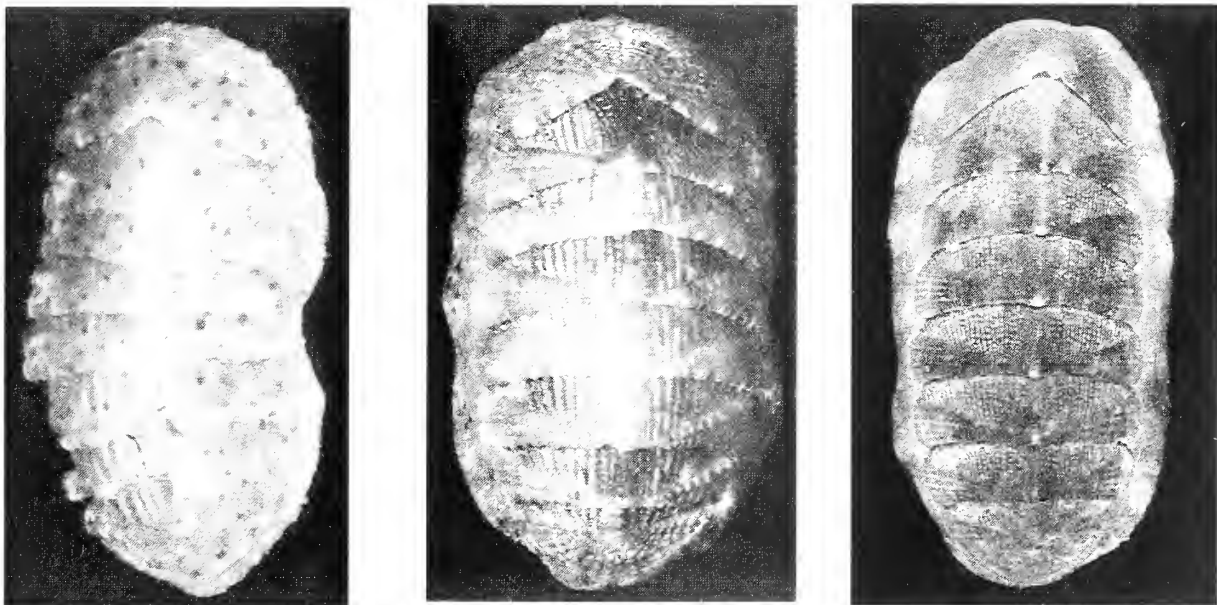
Lepidozона (L.) crockeri (Willett in Hertlein & Strong, 1951). Previously known from near Isla Monserrate (1 specimen), Isla San Jose (1 specimen), and the Gorda Banks (1 specimen), all off Baja California Sur, in the Golfo de California, México (Ferreira, 1974). Thorpe in Keen (1971) mentions another specimen, but Ferreira (1974) was not able to locate it. Extend distribution north to Bahía de los Angeles, Baja California. Over the years, we have dredged four specimens (Figure 6) from off Isla Smith at the north end of the bay in 60 to 183 m.

Lepidozона (L.) formosa Ferreira, 1974. Previously known from Isla Blanca (2 miles south of Puerto Escondido, Baja California Sur), Isla San Francisco, and Isla Cerralvo, all in the Golfo de California, México (Kaas & Van Belle, 1987). A rare species previously known from only three specimens from the islands off Baja California Sur. A small (6.4 mm) specimen dredged at Bahía de los Angeles, Baja California, from 20 to 40 m, extends the distribution north in the Golfo de California. This specimen (Figure 7) has the tan base color with the red-maroon dots noted by Ferreira (1974) for the specimen he took at Isla Blanca. Two additional specimens, that match the color description for the species, extend the distribution south to Punta Mita, Nayarit, dredged from 30 to 60 m (Figure 8), and Manzanillo, Colima, México. The Manzanillo specimen was dredged at 50 m by Carl and Laura Shy. Both of these specimens were identified by Ferreira.

Lepidozона (L.) laurae Ferreira, 1985. Previously known only from off Punta San Antonio, north of



Figures 4-6. (4) *Stenoplax boogii* (Haddon, 1886). Off Punta La Gringa, Bahía de los Angeles, Baja California, México. Dredged 20 to 40 m. Length: 13.4 mm. Photo: P. Skoglund. (5) *Stenoplax circumscissa* Berry, 1956. Off Punta la Gringa, Bahía de los Angeles, Baja California, México. Dredged 20-40 m. Length: 20.5 mm. Photo: D.K. Mulliner. (6) *Lepidozonia crockeri* Willett in Hertlein & Strong, 1951. Off N.W. Isla Smith, Bahía de los Angeles, Baja California, México. Dredged 183 m. Length: 22 mm. Photo: P. Skoglund.



Figures 7-9. (7,8) *Lepidozonia formosa* Ferreira, 1974. (7) Off Punta La Gringa, Bahía de los Angeles, Baja California, México. Dredged 20 to 40 m. Length: 6.4 mm. (8) Off Punta Mita, Nayarit, México. Dredged 30 to 60 m. Length: 9 mm. Photos: P. Skoglund. (9) *Lepidozonia laurae* Ferreira, 1985. Off NW Isla Smith, Bahía de los Angeles, Baja California, México. Dredged in 120-183 m. Length: 10 mm. Photo: D.K. Mulliner.

Guaymas, Sonora, México (Ferreira, 1985a). Extend distribution across the Golfo de California to off Isla Smith, Bahía de los Angeles, Baja California, where a single specimen was dredged from 120 to 183 m (Figure 9). Ferreira (1985a) cited two specimens from the Skoglund Collection which he had identified. These were dredged off Punta San Antonio. One of the two is clearly this species, but the other specimen does not seem to match the requirements for the species.

Lepidozona (L.) pectinulata (Pilsbry, 1893, ex Carpenter MS). Previously known from San Luis Obispo County, California, to Bahía Magdalena, Baja California Sur, México (Ferreira, 1978). A single specimen (Figure 10) extends the distribution into the Golfo de California to Bahía de los Angeles, Baja California, dredged in 20 to 40 m. A Californian species here reported in the Golfo de California for the first time.

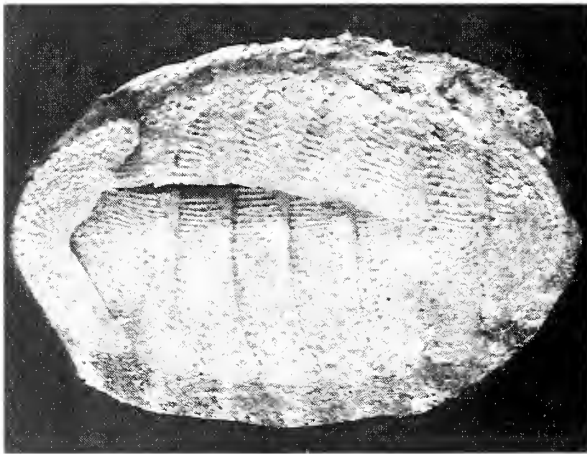


Figure 10. *Lepidozona pectinulata* (Pilsbry, 1893, ex Carpenter MS). Off Punta La Gringa, Bahía de los Angeles, Baja California, México. Dredged 20 to 40 m. Curled length: 16 mm. Photo: P. Skoglund.

Lepidozona (L.) serrata (Carpenter, 1864). Previously known from Monterey, California, to Mazatlán, Sinaloa, México (Ferreira, 1974). Extend distribution south to Caleta de los Angeles, Bahía Tenacatita, Jalisco, México, in the intertidal zone (Figure 11).

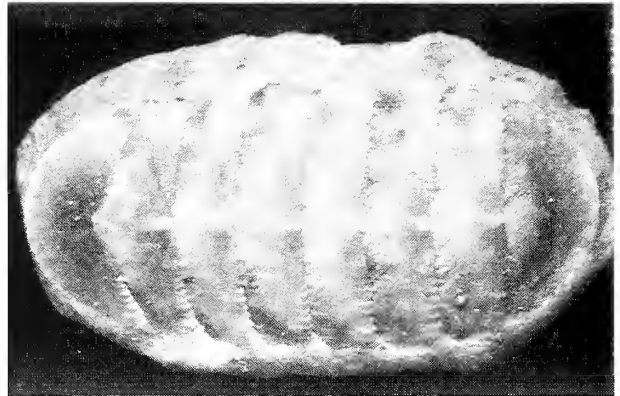


Figure 11. *Lepidozona serrata* (Carpenter, 1864). Caleta de los Angeles, Bahía Tenacatita, Jalisco, México. On underside of rock at low tide. Length: 7 mm. Photo: P. Skoglund.

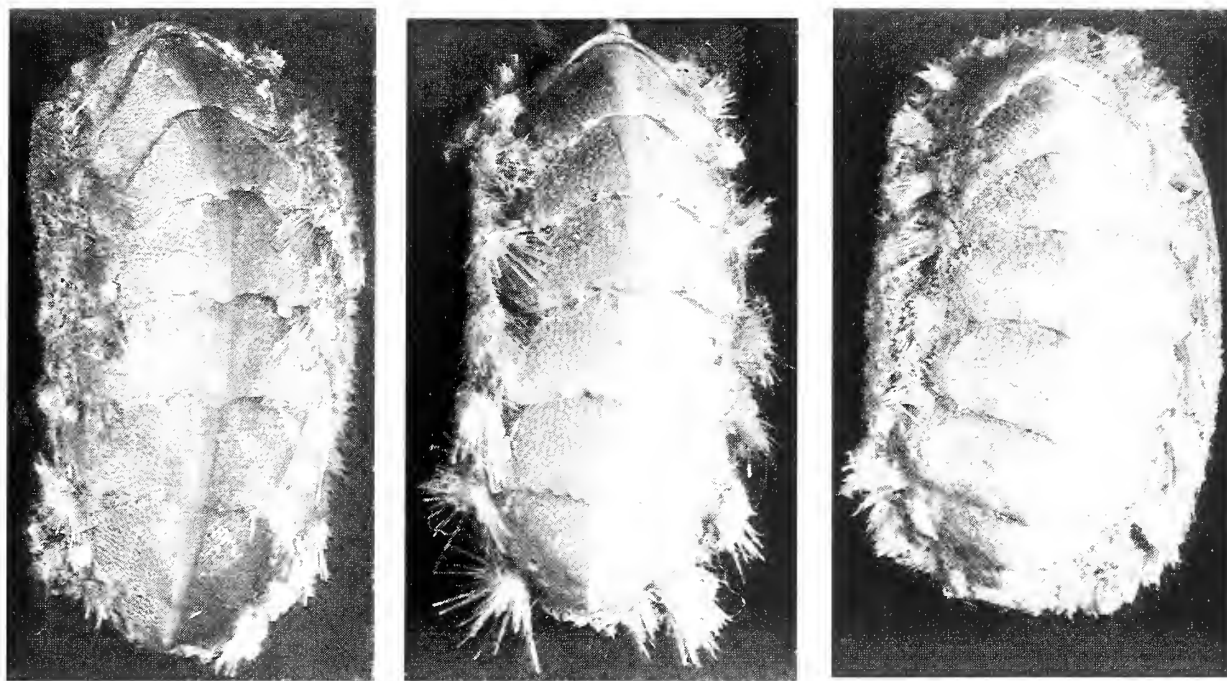
Family ACANTHOCHITONIDAE

Genus *Acanthochitona* Gray, 1821

Acanthochitona angelica Dall, 1919. Previously known from Bahía de los Angeles, Baja California, and Islas Tres Marias, México and Islas Galápagos, Ecuador (Watters, 1981). Include off Playas del Coco, Guanacaste Province, Costa Rica, dredged 9 to 18 m (Figure 12), and off Isla Ranchería, Golfo de Chiriquí, Panamá in distribution (Figure 13), in 24 to 36 m. The Playas del Coco specimen is an unusual bright orange form.

Acanthochitona avicula (Carpenter, 1864). Previously known from southern California to Baja California Sur and on the Gulf side of Baja as far north as Agua de Chale [south of San Felipe] and Punta [Bahía la] Cholla, Sonora, México (Watters, 1990). A single specimen extends the distribution south to Punta Mita, Nayarit, México, dredged in 8 to 20 m (Figure 14).

Acanthochitona imperatrix Watters, 1981. Previously known from San Diego, California; off La Paz, Baja California Sur, México and Isla Santa Cruz, Galápagos, Ecuador. Add San Vicente, Bahía Caráquez, Manabí Province, Ecuador, to distribution. One specimen (Figure 15) was taken from the underside of a rock at low tide.



Figures 12-14. (12, 13) *Acanthochiton angelica* Dall, 1919. (12) Off Playas del Coco, Guanacaste Province, Costa Rica. Dredged 9 to 18 m. Curled length: 11 mm. (13) Off N.E. Isla Ranchería, Golfo de Chiriquí, Panamá. Dredged 24 to 36 m. Curled length: 9.7 mm. (14) *Acanthochiton avicula* (Carpenter, 1864). Off Punta Mita, Nayarit, México. Dredged 8 to 20 m. Curled length: 9.4 mm. Photos: P. Skoglund.

A special thanks to Roger Clark, of Klamath Falls, Oregon, who identified the *Hanleyella oldroydi* and the *Lepidozona pectinulata*. He also spent a day verifying some of my other identifications, for which I am truly grateful. Photographs for Figures 5 and 8 are by David K. Mulliner. All other photographs are by Paul Skoglund, with enhancement and reprinting by D.K. Mulliner. I thank them both for their considerable effort.

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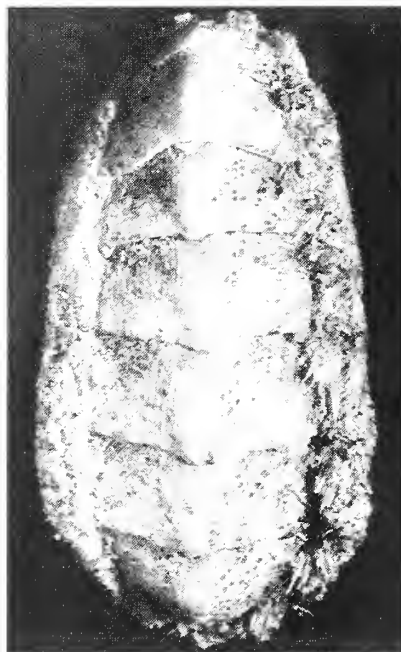


Figure 15. *Acanthochiton imperatrix* Watters, 1981. San Vicente, Bahía Caráquez, Manabí Province, Ecuador. On underside of rock at low tide. Curled length: 8.3 mm. Photo: P. Skoglund.

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BOOK NEWS

The Marine Fauna of New Zealand: Index to the Fauna 3. Mollusca.

By: Hamish G. Spencer & Richard C. Willan
New Zealand Oceanographic Institute Memoir 105.
Softbound, 125 pages. 1995.

As stated in the abstract, "a list of all 2510 species and subspecies of Recent and Subrecent Mollusca from New Zealand is given. Each entry is substantiated by a bibliographic reference for the record and its most recent nomenclatural combination." Also included here is a 10-page Literature Cited for the 42-page Checklist of marine and non-marine mollusks, Index to the checklist, and a 30-page annotated and cross-referenced Bibliography covering the years 1981-1993 [updating that of Willan, 1981].

This major work will be a necessity for those working on the Mollusca of New Zealand.

Also received from the NZOI were two other segments in their series on **The Marine Fauna of New**

Zealand, both published in 1996. One, Memoir 107, treats the **Porifera: Demospongiae Part 5. Dendroceratida and Halisarcida**. This 53-page book with 2 color plates and 5 b&w plates is by Patricia Bergquist. The other, Memoir 106, treats the **Athecate Hydroids and their Medusae (Cnidaria: Hydrozoa)**. The 159-page monograph with 1 color plate and 85 b&w figures is by Peter Schuchert.

Sent also is a notice of the latest publication, **Bryozoans in Space and Time**, Dennis P. Gordon et al. (Eds), 1996, the Proceedings of the 10th International Bryozoology Association Conference, Wellington, New Zealand, 1995, available at \$110 US + \$18 postage.

To order any of the publications, write to NIWA [National Institute of Water and Atmospheric Research], P.O. Box 14-901 Kilbirnie, Wellington, New Zealand, Attn: R.M. Thompson.

AMU/WSM MEETING

JULES HERTZ¹

Associate, Santa Barbara Museum of Natural History, 2559 Puesta del Sol Road,
Santa Barbara, California 93105, USA

A combined meeting of the AMU/WSM was held on 21-27 June 1997 at the Radisson Hotel, Santa Barbara, California. This was the largest combined meeting for these two organizations with over 200 attendees, including 37 attendees from overseas representing 14 different countries. The meeting got off to a great start with very efficient registration, at which each attendee was given an attractive booklet entitled Program and Abstracts. This featured the logo for the combined meeting, designed by Sue Stephens, which was also featured on the T-shirts being sold. The meeting had four complete days of technical sessions, outstanding social events and field trips.

The first event was the Presidents' Reception at the Cabrillo Pavillion, hosted by Eugene V. Coan and Henry W. Chaney the respective 1997 Presidents of the AMU and WSM (Figure 1). The large room over-

looked a sandy beach and the Pacific Ocean. Scattered throughout this large room were several stations where one could snack on roast beef, soup and cheeses, have drinks and meet fellow attendees in a very relaxed atmosphere. It was a great start to an excellent meeting. The following day the technical papers started with morning and afternoon sessions of a Deep-Sea Symposium and concurrently in the afternoon there were contributed papers in a session called Biology and Ecology. The papers I found particularly interesting were Amelie Scheltema's "The Aplacophora as a deep-sea taxon," Janet Voight's "Studies of hydrothermal vent fauna, especially gastropods" and James Nybakken's "Invertebrate megafauna, community structure and molluscan associates at three deep-sea sites off central California." Two of the more technical presentations were made by foreign visitors, Gerhard Hazprunar from Germany and Yuri I. Kantor from Russia (Figures 2 and 3). In the evening there was a



Figure 1. Henry Chaney and Eugene Coan, WSM/AMU presidents.



Figure 2. Gerhard Hazprunar at the podium

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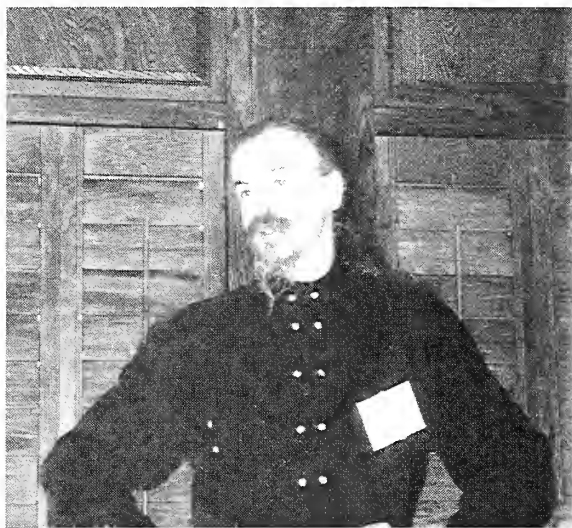


Figure 3. Yuri Kantor answering questions.

brief slide show followed by a two-hour Cladistics Workshop conducted by Gary Rosenberg. The workshop was well attended with some professionals as well as many amateurs trying to get some basics on cladistics. I came away a little smarter but still very confused by the terminology and construction techniques.

Tuesday had single sessions, both morning and afternoon, featuring contributed papers on Taxonomy and Evolution, and in the afternoon there was an extensive Poster Session with posters on deep-sea animals, North Pacific cephalopods and general contributed papers. Although Tuesday's papers heavily emphasized the use of cladistics, there were a number of papers which relied less on cladistics, which I appreciated. Among these were Carole S. Hickman's "Form, function and diversity of epithelial sensory structures in trochoidean gastropods" and Daniel L. Geiger's "Taxonomic problems with tropical members of the family Haliotidae (Gastropoda: Prosobranchia)." In the evening there was a trip to the Gainey Winery in the Santa Ynez Valley for a tour, extensive tasting of their wines and a marvelous Santa Maria barbecue. The latter held in the outdoors on a beautiful evening with festive tables featured some fine wines and tri-tip roast which was so tender that it was easily cut with plastic knives.

Concurrent sessions on Wednesday were titled Phylogenetic Systematics and Cephalopods of the North Pacific (as well as contributed papers on

cephalopods). Particularly thought-provoking in a systematics session were Douglas J. Eernisse's "The challenge of resolving high-level molluscan phylogeny with separate or combined data sets" and Barry Roth's "Popular delusions, phantom taxa, and the weirdness of ranks." In the cephalopod session, James A. Cosgrove's paper "In-situ observations of nesting *Octopus dofleini*, the giant Pacific octopus," had fantastic underwater photographs of the eggs of the giant octopus. Wednesday evening featured a very successful WSM reprint sale (Figure 4) run by George Kennedy



Figure 4. Searching for bargains at the reprint sale.

followed by an AMU/WSM auction of books and art. The auctioneers were Dick Petit and Hank Chaney and their humorous antics succeeded in raising money despite a rather limited selection of auction material. This author missed the politically incorrect shell auction normally held at annual WSM meetings.

The final day of papers saw the continuation of the symposium on Cephalopods of the North Pacific and Contributed Papers: Biology and Ecology. I particularly enjoyed Patricia Miloslavich and Pablo Penchaszadeh's paper, "Early development of *Crucibulum auricula* and *Crepidula convexa* (Gastropoda, Prosobranchia, Calyptraeidae) from the Venezuelan Caribbean," which had marvelous photographs of eggs and embryos. The final social event of the meeting was the banquet, held that evening at the Santa Barbara Museum of Natural History. Following the creek-side group photograph there were plentiful hors d'oeuvres and drinks as the

attendees socialized on the back patio. The banquet followed in the Fleischman Auditorium and was ideal in that the food was excellent and the remarks brief. Student-paper awards were given to Steve Lonhart, University of California at Santa Cruz, and Jeb Beyers, University of California at Santa Barbara. A special award was presented by the Cephalopod International Advisory Council (CIAC) to Dr. Takashi Okutani.

On the final day of the meeting the attendees

dispersed, some rushing home while others attended the field trips. The offered events were a fossil tour, Channel Island cruise and a tour of the Santa Barbara Museum of Natural History. The consensus of the attendees was that the meeting was outstanding. Both AMU and WSM in their respective business meetings voted to join with UNITAS when they meet in Washington, D.C. in July 1998, the first UNITAS meeting ever to be held in the USA.

IN MEMORIAM

ANTHONY D'ATTILIO

1909 - 1997

With great sadness we report the passing of Anthony D'Attilio on 29 June 1997. Tony was a "Renaissance Man." He was a scientist specializing in the Muricidae who published extensively on the family worldwide and co-authored with the late George E. Radwin the landmark work *Murex Shells of the World*. He was an artist and scientific illustrator, a philosopher, a family man and a good friend to those who knew and worked with him. Anthony D'Attilio was a longtime Club member, contributor to *The Festivus* and on its scientific review board for many years. He will be greatly missed.

Tony is survived by his daughter Sandra, son Lawrence, seven grandchildren and two great-grandchildren. Our heartfelt sympathy goes out to his family.

A memorial issue dedicated to Anthony D'Attilio will be published by *The Festivus* in an upcoming issue.

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THE FESTIVUS

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Meeting date: third Thursday, 7:30 PM
Room 104, Casa Del Prado, Balboa Park

Come to the September Party

Saturday evening, 20 September
[See map on last page for details.]

(There will be no regular meeting this month.)

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CLUB NEWS

Dr. George L. Kennedy Joins The Festivus Scientific Review Board

It is with pleasure that we welcome Dr. George L. Kennedy to *The Festivus* Scientific Review Board. Dr. Kennedy, in the Department of Geological Sciences at San Diego State University, has written extensively on the fossil assemblages of the Pacific coast with particular emphasis on the Pholadidae. Our thanks to him for accepting this responsibility.

Minutes of the San Diego Shell Club Meeting - August 21, 1997

Terry Arnold called the meeting to order at 7:40 p.m. The minutes of the July meeting were accepted as published in *The Festivus* and several guests were welcomed including newlyweds, Michael Hollmann and Regina Vogel, members from Germany. Terry passed around the signup sheet for the September Party. Attendees will be bringing a variety of munchies for all to enjoy [see below].

We introduced the speaker for the evening. Member Bob Yin is a familiar face to Club members. His award-winning work as an underwater photographer includes publication in *National Geographic* and in children's books among others. Bob began by discussing the fact that until 5 or 6 years ago the Philippines was a quiet place with inexpensive and sparse accommodations. Things have changed a lot in recent years, though prices are still reasonable. Today accommodations have all the comforts of home including hot showers and air conditioning. He said that the waters between the Philippines, Malaysia and Indonesia are among the richest in the world. The Philippines is comprised of about 7,000 islands and a resort can occupy a whole island. Almost all of them have reefs rich in sea life. Bob's photos included many colorful fish, corals and mollusks. A rare find was a seahorse in the Sulu Sea. Also, he mentioned that there is a marine park that serves as a sanctuary for turtles and turtle research. The project is a cooperative effort between the Philippines and Malaysia. Bob's talk made us all want to leave immediately for the Philippines and was enjoyed by all.

Kim announced that the publication *Registry of*

World Record Size Shells is for sale. The door prize winner was Larry Catarius. Refreshments were brought in by Bill Romer, the Dankos and the Lindahls. After the motion to adjourn, many members enjoyed browsing through and purchasing reprints for sale and chatting about our favorite subject.

Silvana Vollero

The September Party - Munchie Madness

This is your last notice to attend the party, to be held on 20 September at the home of Marty and Terry Arnold. It's to be a "munchie" party with guests bringing "heavy hors d'oeuvres and desserts" (hot and cold appetizers and finger foods or desserts) to be eaten in the hand and to serve twelve people. [See map, this issue.]

If you would like to come to the party and have not had the opportunity to list your contribution on the sign-up sheet, call Margaret Mulliner (619-488-2701) and she will be happy to add you to the list.

There will be no regular September meeting. The party will be great fun. Don't miss it!

Additions and Changes to the Roster

Add new E-mail addresses:

Romer, Bill. wromer@inetworld.net

Hertz, Carole & Jules. cmhertz@pacbell.net

[same E-mail address for *The Festivus*]

Correction to E-mail address:

Hollmann, Michael. Hollmann@mail.mpiem.gwdg.de

The 1998 Shell Desk Diary is Announced

RobAllen Press, Inc. announces the 1998 edition of the Shell Desk Diary, this year featuring the Republic of Palau with photographs by photographer and environmentalist Lynn Funkhouser in a 32-page color section.

The Diary comes in a Deluxe version at \$19.95 and the regular Shell Desk Diary at \$16.95. Add \$2.95 for shipping and handling in the US. For further information or to order, call (713) 984-7518.

RECENT RECORDS OF *COCHLICELLA BARBARA* (LINNAEUS, 1758) (HYGROMIIDAE) IN SOUTHERN AND CENTRAL CALIFORNIA

BARRY ROTH¹ and CAROLE M. HERTZ²

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²Associate, Santa Barbara Museum of Natural History, 2559 Puesta Del Sol Road,
Santa Barbara, California 93105, USA

The European land snail species *Cochlicella barbara* (Linnaeus, 1758) was first found in California by Henry Hemphill in gardens in the city of Oakland, Alameda County (Stearns, 1900; as *Bulimus ventrosus* [Férussac, 1820], a junior synonym). Hemphill's collection at the California Academy of Sciences dates the find as 1899. The record was repeated by Keep & Baily (1935), Hanna (1939; both as *Cochlicella ventricosa* [Draparnaud, 1805]), Pilsbry (1939), and Ingram & Lotz (1950; both as *Cochlicella ventrosa* [Férussac]). No later reports from Oakland exist, in spite of the activities of many land malacologists resident in Alameda County, including W. J. Raymond, W. M. Ingram, and A. G. Smith. We do not know whether the species still occurs there.

Hanna (1966) reported that the species (as *C. ventrosa*) was found in "an area of several blocks" in Santa Cruz, Santa Cruz County in 1964. Gordon (1974, 1977) reported it from near West Cliff Drive in Santa Cruz. The following additional records from the senior author's collection indicate that *Cochlicella barbara* continues to be found in the northern Monterey Bay area, where its habitats include gardens, fields of truck crops, weeds on waste ground, and grassland on unusual knoll-and-swale topography ("mima mounds") developed on a marine terrace (all, CALIF.: Santa Cruz County):

Mima mounds area, west of Santa Cruz between Empire Grade and California Highway 1, elev. approximately 120 m. Grey coll. 1992. On English pennyroyal (exotic) in largely native grassland.

King Street near Mission, Santa Cruz. R. Everett coll. 15 April 1979.

Garden near corner of Hastings Lane and Green Valley Road, Watsonville. D. Shonman coll. 22 September 1974. Clumped at base of Swiss chard, squash, and sunflowers.

Cochlicella barbara was found for the first time in southern California in September 1996 by Richard Cerutti and Fritz Clark, in open ground on the south bank of the San Diego River, near the intersection of Mission Gorge Road and Fanita Drive in the city of Santee. The snails were common at this site, with living snails found in moist shaded areas under leaves and bushes and empty shells lying around on the ground. Other introduced land snails present at the locality included *Rumina decollata* (Linnaeus, 1758), *Theba pisana* (Müller, 1774), *Otala lactea* (Müller, 1774), and *Helix aspersa* Müller, 1774. Specimens of *C. barbara* from this locality are deposited in the Santa Barbara Museum of Natural History (SBMNH 144183) and the senior author's collection.

The shell of *Cochlicella barbara* (Figures 1 and 2) is approximately 8-12 mm high and 5-8 mm broad, acutely conic, with 7-8 whorls. The suture is appressed and the whorls are flattened, sometimes overhanging the suture. There are 1.3 projecting embryonic whorls, smooth or with a few low radial wrinkles. The post-embryonic sculpture consists of very low, inconspicuous collabral rugae; the base has a few fine, shallow, almost obsolete, incised spiral striae and very minute diagonal wrinkling. The umbilicus is minute, partly covered by the inner lip. The aperture is elliptical; the lip is thin, simple, not turned outward except at the base, and dilated over the umbilical region. *Cochlicella barbara* differs from all native Californian species in its tall, acutely conic shape.

The species is polymorphic for shell color and banding. The ground color of the shell is either translucent, grayish brown (generally with opaque whitish

flecks) or solid, opaque white. One or more brown spiral bands are sometimes present on the white shells. All central Californian specimens we have examined are translucent, grayish brown with whitish flecks (Figure 1); no banding is evident. The San Diego River specimens (Figure 2) include opaque white shells, with and without a brown band, as well as translucent, grayish brown shells. The presence of the opaque white forms in the San Diego River population probably rules out central California as the source of the San Diego introduction. The founding individuals of the San Diego River population must have come from a population in which the alleles for white ground color and shell banding were present. These color forms probably would have appeared in central Californian populations if the genetic potential to produce them were present.

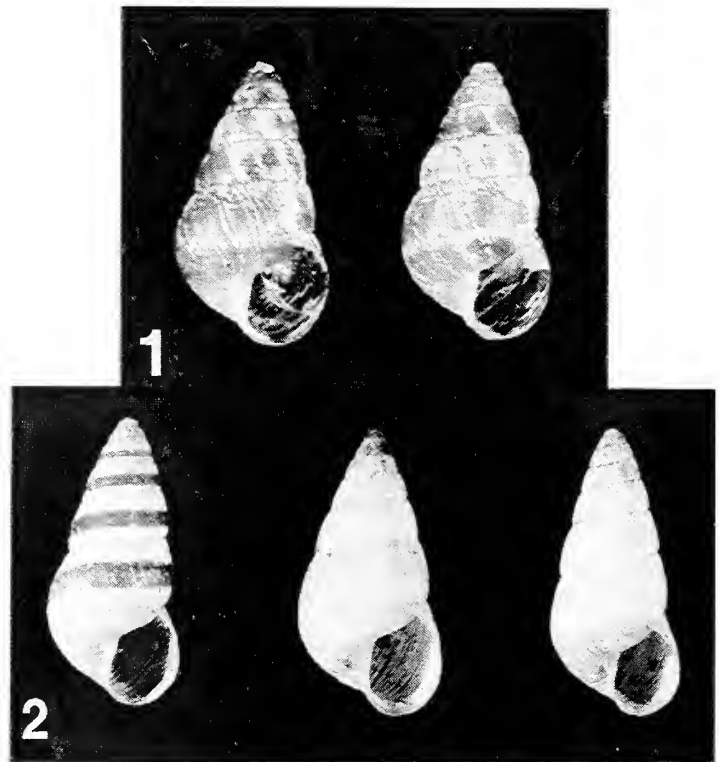
Some authors (e.g., Burch, 1960) have applied the name *Cochlicella barbara* to the species more generally known as *C. acuta* (Müller, 1774), which differs in being less broadly conic. We follow the usage now prevailing among European authors (e.g., Kerney & Cameron, 1979). *Cochlicella acuta* is also a potential introduction to California. Its shell is very elongate-conic, 10-20 x 4-7 mm, with 8-10 slightly convex whorls with moderately impressed sutures (see Kerney & Cameron, 1979, pl. 24, figs. 2a, 2b). The collabral ridges of *C. barbara* are slightly more produced than those of *C. acuta*, especially on the last whorl.

Cochlicella barbara is native to the Mediterranean region and western Europe. In addition to California, it has been introduced to the Azores, Bermuda, South Africa, Japan, and Australia. In Europe it inhabits dry, exposed sites near the sea, especially dunes, and is more rarely found inland (Kerney & Cameron, 1979).

Cochlicella barbara is reported to be a pest of pastures and legume crops in South Africa. It is an intermediate host of nematode and fluke parasites of livestock (Godan, 1983; Baker, 1986).

ACKNOWLEDGMENTS

We thank Richard Cerutti and Fritz Clark, who collected the San Diego River specimens and brought them to CMH's attention, and Grey, David Shonman, and David R. Lindberg, who brought central Californian specimens to BR.



Figures 1, 2. *Cochlicella barbara* (Linnaeus, 1758) from California. (1) King Street near Mission, Santa Cruz, Santa Cruz County (BR 1144); height 7.5 mm (2) south bank of San Diego River, near intersection of Mission Gorge Road and Fanita Drive, Santee (BR 1997); height of left (tallest) specimen 9.2 mm.

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BOOK NEWS

Cien Caracoles Argentinos

By: Carlos Núñez & Tito Narosky.

Photography: Quique Núñez

Publisher: Editorial Albatros Saci, Buenos Aires, Argentina. 1997

Softcover, 6 x 8½", 157 pp., 100+ color photos, 13 b&w drawings, 1 map. In Spanish.

Price: \$23.00 US

The San Diego Shell Club library was very fortunate to receive a courtesy copy of this fine little guide, part of a series on the natural history of Argentina.

The book treats 100 selected marine mollusks (63 gastropods, 37 bivalves) from the over 1000 species estimated to be found in Argentinian waters. Of these only 9 are considered Argentinian endemics, the others found also in one or more of the neighboring countries of Uruguay, Brasil and Chile. The more abundant species and those of special interest either for beauty or economic interest are featured. No shells less than 10 mm are included.

The species are arranged systematically according to Vaught (1989), *A Classification of the Living*

Mollusca. Each species treated has both common and scientific name (authors and dates are given in a listing in the back of the book); general information on habitat, morphology, biology and help in differentiating similar species; synonymy; description; geographical distribution; and excellent color photographs of a size and arrangement to make identification easy.

Also included in the back of the book is an index to species, a glossary, sections on collecting, cleaning and care of mollusks, means of collecting, conservation, exchange and commerce in shells, and addresses of malacological organizations and publications.

This new moderately-priced work is a very welcome arrival. It is a helpful guide for those interested in the more available shells of Argentina and the surrounding areas of the Atlantic coast with exceptionally fine photographs for identification. It is hoped that a more complete guide to the malacological fauna of the area will join this first malacological work of this area.

Books can be ordered from: Editorial Albatros, Casilla de Correo N°138 (1412) Sucursal 12 Capital federal. República Argentina or E-mail Albatros@editores.com or FAX 981-1161.

Carole M. Hertz

NOTES ON THE VEILED CHITONS, *PLACIPHORELLA VELATA* AND *PLACIPHORELLA RUFA*

ROLAND C. ANDERSON

The Seattle Aquarium, 1483 Alaskan Way, Seattle, Washington 98101, USA

Almost all chitons are herbivores. With a rasping tongue (a radula) they scrape diatoms and small algae off rocks. The teeth on the radulae of chitons are made of magnetite (Kozloff, 1990), a very hard material. The teeth of some chitons (e.g. *Tonicella lineata*) are so hard they can scrape off and eat calcareous algae. Chitons have been known to scratch the inner surface of plexiglass aquarium tanks with the teeth on their radulae. Several chitons in the family Mopaliidae (e.g. the mossy chiton *Mopalia muscosa*) are partial predators (McLean, 1962). One genus in the same family, *Placiphorella*, is known to be almost totally carnivorous.

There is only one species of *Placiphorella* found in the North Atlantic and at least five in the North Pacific (Abbott, 1974). Several of these are deepwater species, down to 600 fathoms. Two are commonly found on the Pacific Coast, *Placiphorella velata* and *P. rufa*, with *P. velata* being found intertidally. *P. velata* (Figure 1)

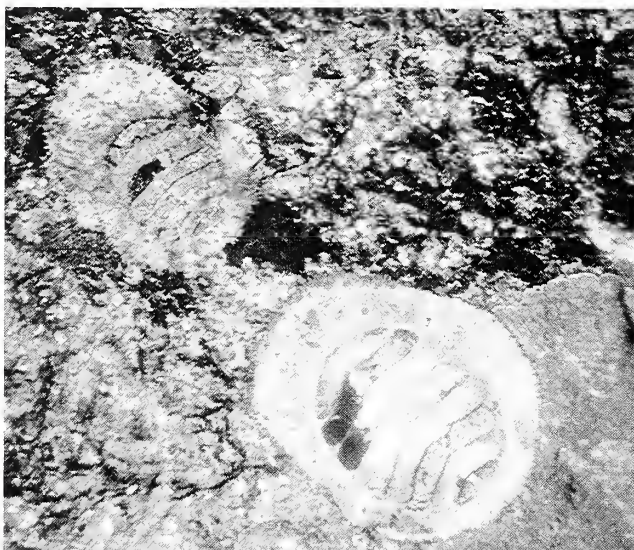


Figure 1. Two veiled chiton, *Placiphorella*, at their "home bases" in a tank at the Seattle Aquarium. Photo: Leo J. Shaw.

ranges from Alaska to southern California and *P. rufa* from Alaska to Washington. *Placiphorella rufa* has hairs just around the edge of their girdle while *P. velata* has hairs all over the girdle (Burghardt & Burghardt, 1969).

Veiled chitons prey on other animals by lifting up a produced flap of the girdle at the head end (the "veil") at about 45° (Figure 2). Small crustaceans and worms

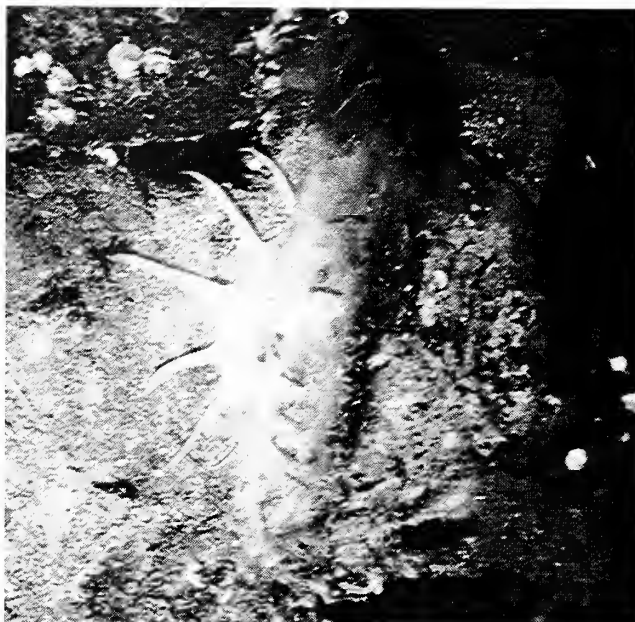


Figure 2. Head-on view of a veiled chiton with veil raised, showing pre-cephalic tentacles pressed to a rock. Photo: Leo J. Shaw.

crawl under this raised flap and hit a trigger, and the chiton lowers the flap rapidly, trapping the prey underneath (McLean, 1962). The prey is worked inward to the mouth and eaten. Using this method, *P. velata* have even been able to catch and eat small fish (Dr. Greg Jensen, Univ. Wash., pers. comm.). Such action is probably the fastest movement by any chiton - the "veil" comes down in less than half a second.

It is difficult to find and collect species of *Placiphorella*. I saw my first veiled chiton (probably *P. velata*) in 1992 while diving 40 feet deep at Cape Flattery on the northwest corner of the Olympic Peninsula in Washington State. All I saw was a round red-streaked flap sticking out of a crevice in a rock. I had to go home and do considerable research before I figured out what the animal was (see Anderson, 1992). Later, in the summers of 1993 and 1994 I found several *P. rufa* in the same area at 70 feet deep. These had not previously been found in Washington (Clark, 1992) and I wrote a range extension for them (Anderson, 1993). I was able to pry the *P. rufa* off the rocks they were attached to with my dive knife and bring them back to the Seattle Aquarium.

On the advice of several local chiton experts, Roger Clark (Klamath Falls, OR) and Tom Rice (Of Sea and Shore Museum, Port Gamble, WA), I made a collecting trip to Neah Bay (near Cape Flattery) specifically looking for these chitons on a low tide in June 1996. I found six *P. velata* in the space of a hundred yards, but not without travails. I found them on the inside of the Neah Bay jetty. This jetty protects a small fishing village from ocean swells, and as such is made of four to five foot boulders piled fifteen feet high. Even then, swells regularly break over the jetty in wintertime. Scrambling over these rocks clad in hip boots and carrying a bucket was not easy. I expected to find them on the undersides of rocky overhangs, but all were on nearly horizontal surfaces. I used a cheap, dull kitchen knife to pry them off the rocks.

On a later dive trip to the same area, five Seattle Aquarium divers looking exclusively for these chitons found 18 in the space of 200 yards. This was a considerable effort as we really had to scour the rocks to find them. Many were in shallow depressions in the rocks that the chitons nearly filled up. Again, all were found on mostly horizontal surfaces, on rocks near the base of the jetty at about the lowest tide level. The rocks there were just starting to be covered with pink coralline algae (*Corallina* spp.) which these chitons matched with pink streaks on their girdles and with coralline algae growing on their shells.

To my mind, these are the toughest chitons to get off rocks, far more difficult than mossy chitons (*Mopalia* spp.) or black katies (*Katharina tunicata* (Wood, 1815)). We have the world's largest chiton in the Pacific Northwest, the gumboot chiton (*Cryptochiton stelleri* (Middendorff, 1846)), which can grow to well over a foot long and these are positively easy to collect

in comparison. While diving, we again used kitchen table knives to pry off the chitons. Once we got a knife under a chiton, just lifting on the knife only bent it; we had to twist and lift to get them off. Although several of these were cut severely in the collection process, only three died in the week after collection. All the rest have survived to date.

The chitons were placed upright (most chitons have a limited righting ability if dislodged) in a 45 gallon display tank with a naturalistic-looking fiberglass backdrop and large pea gravel on the bottom. Filtered sea water was supplied via the Aquarium's sea water system at the rate of approximately a gallon a minute. The *P. rufa* collected earlier were already established on small rocks, which were transferred to the display tank. The *P. rufa* remained on their rocks but the *P. velata* began crawling all over the tank, even crawling partially out of the water on the glass and backdrop.

On the basis of their tank exploration I initially thought that the *P. velata* were more active than the *P. rufa* (see Anderson, 1996) but in the succeeding months the *P. velata* established "home spots" on the backdrop, mostly in the upper half, and have since moved very little. Several have taken up residence directly beneath the water inlet, so food items carried in water currents pass under their veils and hence get caught.

Placiphorella velata taken from the wild had a fair amount of algae in their guts (McLean, 1962), indicating they were omnivores. In aquariums, since they crawl very little, they are probably just eating the brine shrimp I feed them. Other researchers have fed amphipods, small crustaceans and worms to *P. velata* in captivity (McLean, 1962). Small amphipods were eaten whole in about an hour while small crabs were rasped into edible-sized pieces before ingesting them in about 24 hours. At the Seattle Aquarium these chitons are fed live adult brine shrimp (*Artemia* spp.) enriched by adding a bit of Spirulina powder several minutes before feeding them to the chitons, or by soaking the brine shrimp in Artemate[®], available from Argent Chemical Laboratories, Redmond, WA, several hours before feeding. The Artemate is a fish oil derivative rich in omega 3 fatty acids and is commonly used in the aquarium trade to enhance the food quality of brine shrimp. Although no growth rates have been measured on the chitons, *P. rufa* have survived at the Seattle Aquarium on this feeding regimen for more than two years and *P. velata* over one year.

Besides their predatory uniqueness, these chitons make good demonstration animals in public aquariums.

In addition to the trigger mechanism under the veil they also have sensors on top of them, possibly connected to the hairs on the girdle. These sense whenever a small creature is crawling on top of them, causing the veil to raise in a "cocked" position. Hence, feeding them something like adult brine shrimp (*Artemia* spp.) will not only provoke them to raise their veils (Figure 2) but also show the feeding response. Since the chitons make many strikes without catching prey, the tank has much more action than the normally sedentary herbivorous chitons. The *Placiphorella velata* are particularly striking in appearance with pink streaks on their girdles. Veiled chitons in general make an active display when being fed, which the public enjoys observing.

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News from the California Sea Grant Extension Program Newsletter

International Conference on Zebra Mussels and Aquatic Nuisance Species

The California Sea Grant Program announces an 8th International Conference on Zebra Mussels and Aquatic Nuisance Species. The conference, hosted by the University of California Sea Grant College System, will be held in Sacramento from 15-20 March 1998. The conference in Sacramento will be the first meeting held west of the Rockies and will be a forum for "reviewing accumulated knowledge, the latest field research, technological development, legislation, education, and outreach programs related to aquatic nuisance species. Prevention and management case studies will also be presented..." For further information contact: Elizabeth Muckle-Jeffs, Conference Administrator 800-868-8778.

A New Book on California Marine Protected Areas

The following is excerpted from a review in the Newsletter.

California Marine Protected Areas by Deborah McArdle is a 282-page reference book compiling information on California's 104 Marine Protected Areas (MPAs). It is hoped that the publication will aid in "better understanding the locations and regulations of the marine protected areas of California." Price is \$13.

The book is arranged by regions to make it easier to use with the twelve designation types of California MPAs described first and the rest of the book organized by latitude (N to S) with each of the four regions having a regional map showing the MPAs in that area. Following this, each MPA site is listed individually with a map layout of the area, boundaries (latitude points, offshore distance, coastline length and overlapping boundaries), points of interest and legal fishing-related, kelp harvesting and aircraft regulations.

To order, send \$13 in check or money order made out to UC Regents to Gretchen Frederick, California Sea Grant College system, University of California, 9500 Gilman Dr., La Jolla, CA 92093-0232; phone 619-534-4446.

TWO SPECIES REPORTED FOR THE FIRST TIME FROM THE ISLAS GALÁPAGOS

JULES HERTZ¹

Associate, Santa Barbara Museum of Natural History,
2559 Puesta del Sol Road, Santa Barbara, California, 93105, USA

In reviewing material from the Ameripagos Expedition to the Islas Galápagos, Ecuador, two species were discovered which had never been reported from there before. These species are *Erato* (*Hespererato*) *scabriuscula* Sowerby, 1832, a Panamic species (Figure 1), and *Macoma* (*Scissulina*) *obliquilineata* (Conrad, 1837), a Hawaiian species (Figures 2 and 3). Both species were found in Sullivan Bay, Isla Bartholome (0°17'20"S, 90°33'30"W), Islas Galápagos, March 10-13, 1971. Both lots are in the collections of the Santa Barbara Museum of Natural History (SBMNH), and were previously in the Twila Bratcher-Critchlow Collection.

The lot of *Erato* (*Hespererato*) *scabriuscula*, collected in 1-3 m, contains five specimens varying in size from 2.7 to 4.0 mm, with the specimen shown in Figure 1 being approximately 3.0 mm. The specimens are worn, grayish-brown, and have the minute granules on the dorsal surface which are characteristic of the species. Keen (1971) reported the distribution of *E. (H.) scabriuscula* from the southern end of the Golfo de California to Ecuador. Peña G. (1970) extended the distribution to Tumbes, Perú, and Cosel (1984) included Isla Gorgona, Colombia, in the range.

A single specimen of *Macoma* (*Scissulina*) *obliquilineata* found in Sullivan Bay is shown in Figures 2 and 3. It is in very good condition. It is 17.0 mm long, creamy-white in color rayed with rose, and lacks lateral teeth which distinguish *Macoma* from the tellins. The species was described from the Hawaiian Islands and Kay (1979) reported that it occurs in depth of 12 to 100 m in clean sand.

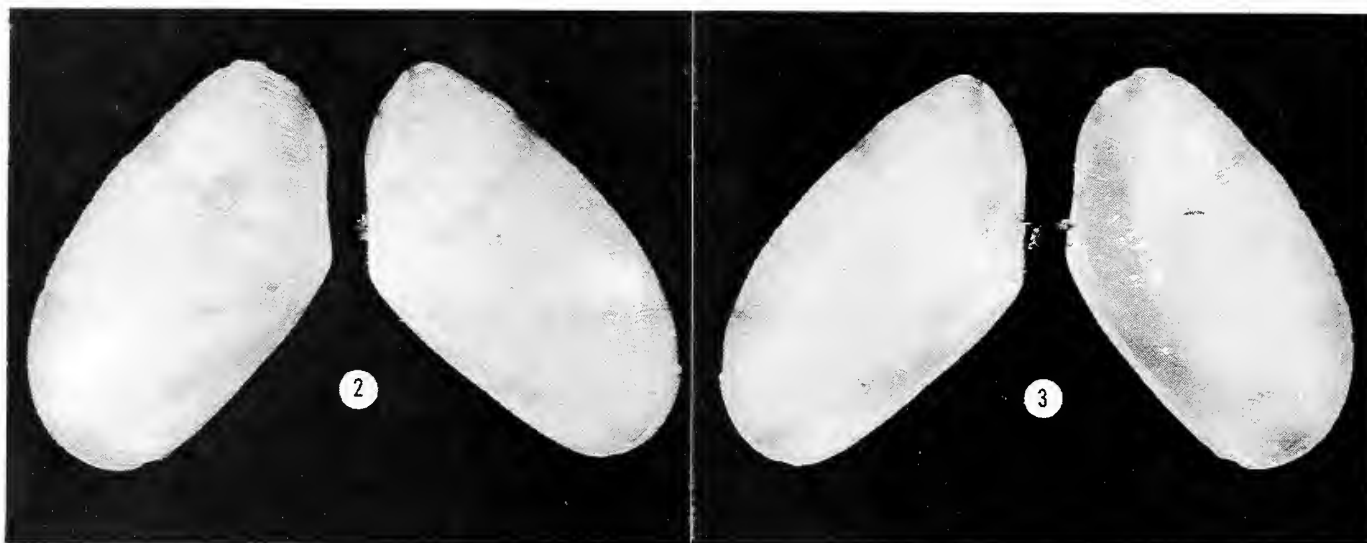
ACKNOWLEDGMENTS



Figure 1. Dorsal view of *Erato* (*Hespererato*) *scabriuscula* (SBMNH 144186), Sullivan Bay, Isla Bartolome, Islas Galápagos, Ecuador (0°17'20"S, 90°33'30"W), 1-3 m, Ameripagos Expedition station 7, March 10-13, 1971, ex Bratcher-Critchlow collection. Photo: David K. Mulliner.

I am indebted to Carol Skoglund for identification of the *Erato*, to Eugene V. Coan and Carole M. Hertz for help in identifying the *Macoma*, and to David K. Mulliner for the photography.

¹Mailing address: 3883 Mt. Blackburn Ave., San Diego, CA 92111, USA



Figures 2-3. *Macoma (Scissulina) obliquilineata* (SBMNH 144185). (2) Dorsal view, Sullivan Bay, Isla Bartolome, Islas Galápagos, Ecuador, Ameripagos Expedition, March 10-13, 1971, ex Bratcher-Critchlow Collection. (3) Interior view of shell in Figure 2. Photos: David K. Mulliner.

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Corrections to the August issue: It has come to our attention that the caption by J. Hertz [p. 76, fig. 3] should read Dmitri Ivanov not Yuri Kantor and Dr. Haszprunar's name was misspelled.

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THE FESTIVUS

A publication of the San Diego Shell Club

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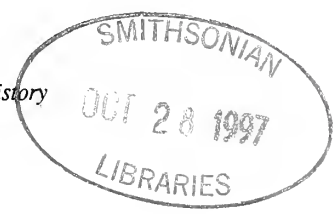
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The Festivus is published monthly except December. The publication date appears on the masthead above. Single copies of this issue: \$5.00 plus postage.

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Meeting date: third Thursday, 7:30 PM
Room 104, Casa Del Prado, Balboa Park



PROGRAM

Marine Life of Vancouver Island

Kathy Kalohi, San Diego Shell Club member and president of the Pacific Shell Club, is a diver and photographer and will share her underwater photos from off Vancouver Island.

Meeting date: 23 October
Shells of the month: northwest Pacific shells

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A review and evaluation of records for <i>Conus orbigny</i> Audoin, 1831, in the eastern Pacific Ocean (Gastropoda: Conidae)	
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CLUB NEWS

The Annual Christmas Dinner Party

The annual Christmas Party will be held on Saturday evening December 6th at the Sheraton Four Points in the same room (the Montfield Room) as last year. Festivities will begin at 6:00 p.m. with no host bar, with the dinner served at 7:00 p.m.

Dinners include salad, vegetables, potato, rolls and butter, dessert and coffee or tea and, as always, the Club will provide dinner wine.

Entree choices are Chicken Breast stuffed with Spinach, Mushrooms and Sun-dried Tomatoes with a Garlic Cream Sauce @ \$23.00 or Oven Roast Pork Loin with Bordelaise Mint Sauce @ \$25.00. A vegetarian plate is also available at \$23.00. Prices include tax and gratuity.

For those who would like to spend the night, the Four Points offers the special rate of \$55 plus occupancy tax.

Dinner reservations must be received by December

1. Plan to attend. It's always a wonderful party.

The September Party - Munchie Madness

Munchie Madness hosted by Marty and Terry Arnold on Saturday evening, September 20th, was a huge success. Over 35 members and guests attended and the company and the food were outstanding. Members outdid themselves in bringing irresistible and delectable finger foods — and some incredible desserts. Everyone seemed to enjoy the casual grazing from one munchie to another. As usual, the desserts ranked high in popularity. One magnificent glazed mixed fruit pie garnered raves.

As is always the case with Club functions, everyone was friendly and relaxed in the balmy evening on the Arnold's lovely deck. Conversation was never at a lull as friends old and new enjoyed each others company.

This was the third year in a row that that Marty and Terry Arnold have made their home available for the September party and the Club thanks them for their generosity and for being such great hosts.

1998. To receive a complete volume for 1997 after October first, the cost will be \$15 for domestic subscribers. For overseas members, \$18 (surface mail) and \$30 (air mail).

Membership for 1998 is the same as for 1997 (see masthead). There will be a "green slip" dues notice included with the November issue. Those interested in having their FAX and E-mail addresses on the 1998 roster should add them on the "green slip."

New Marine Life Book Series for Young Readers

Bob Yin, member and award-winning photographer, has done all the wonderful photography for a series of little books for children on marine life with text by Stanley L. Swartz. There are four books in the series, available in either hard or softcover. The titles are: *Crabs, Shrimp, and Lobsters*; *Coral*; *Fish*; and *Starfish and Urchins*. Each little softcover book sold separately costs \$5.25; sold as a set the price is \$21.00. The hardcover books are \$10.95 each and the set sells for \$43.80. (Add sales tax for California residents and 10% shipping and handling.)

For those interested, phone, FAX or send orders to: Dominie Press, Inc., 1949 Kellogg Ave., Carlsbad, CA 92008. Tel. (800) 232-4570 or FAX (760) 431-8777.

A Catalog of Dealers' Prices...

Belatedly, we notify of the 15th (1997) edition of Tom Rice's *A Catalog of Dealers' Prices for Shells: Marine, Land & Freshwater*. The publication is available at \$19.50 plus postage (\$3 in US of overseas surface). The catalog has 200+pages and 18,000 entries.

To order write to Tom Rice, editor, Of Sea and Shore Publications, P.O. Box 219, Port Gamble, WA 98364, or Tel/FAX: (360) 297-2426 or E-mail: ofseashr@pacific.telebyte.com

Memberships for 1998

All subscriptions/memberships received after the first of October are automatically considered to be for

Addition to the Roster

MIGUEL C. AVILÉS, Apartado 6-765, Zona Postal El Dorado, Panamá, Rep. de Panamá

A REVIEW AND EVALUATION OF RECORDS FOR
CONUS ORBIGNYI AUDOUIN, 1831, IN THE EASTERN PACIFIC OCEAN
(GASTROPODA: CONIDAE)

WILLIAM K. EMERSON

American Museum of Natural History, Central Park West at 79th Street
New York, New York 10024-5192, USA

and

HENRY W. CHANEY

Santa Barbara Museum of Natural History, 2559 Puesta del Sol Road
Santa Barbara, California 93105-3170, USA

INTRODUCTION

Conus (Aspella) orbignyi Audouin (1831:20, figs. 1, 2) is an Indo-west Pacific species commonly trawled by commercial fishermen in moderate to deep depths. This taxon is known from three disjunct populations:

1. The western Indian Ocean, *C. orbignyi elokismenos* Kilburn, 1975 (Natal to Madagascar and Réunion).

2. The western Pacific Ocean, *C. orbignyi s. s.* (Japan, southward to the Philippines) and from off southeastern Australia (Queensland).

3. The south Pacific, *C. orbignyi coriolisi* Röckel, Korn & Kohn, 1995 (the Coral Sea, New Caledonia, and the Loyalty Islands) (Richard, 1983:18; Richer de Forges & Estival, 1986:16; Röckel, Korn & Kohn, 1995:264; Röckel, Richard & Moolenbeek, 1995:578).

Walls (1979:775, 776), however, reported the presence of living specimens of *C. orbignyi* from deep water off Baja California, Mexico. He established these eastern Pacific records based on specimens obtained off Cabo San Lucas, Baja California Sur, by Alex Kerstitch. This citation by Walls (1979) was subsequently included in Skoglund's review (1992: 109) and together they comprise the only published reports on *C. orbignyi* in the eastern Pacific.

Unlike examples of a single occurrence of an Indo-Pacific species in the Panamic faunal province, such as

that of the cypraeids *Erronea caurica* (Linnaeus, 1758) and *Staphylaea staphylaea* (Linnaeus, 1758) (see discussion in Emerson & Chaney, 1995: 15-17), at least a dozen specimens of *C. orbignyi* are attributable to the activities of Alex Kerstitch and associates, in collections made between 1969-1979. This review seeks to document the provenance data of all of these specimens in order to evaluate whether *C. orbignyi* is a naturally occurring constituent of the eastern Pacific. As will be noted below, acceptance of the validity of these records remains problematic. This issue is complicated by the loss of specimens, the corruption of some collection data by poor curation, the lack of corroborating evidence from other collection sources, and the fact that these reports run counter to what is generally known about the habitat, distribution and dispersal of this species in the Indo-West Pacific.

Abbreviations used to denote institutions cited in the text: AMNH = American Museum of Natural History, New York; ICDBUA = Invertebrate Collection, Department of Biology, University of Arizona, Tucson.

MATERIALS and METHODS

This paper is the result of a long-term investigation on the authenticity of the reported occurrence of *Conus orbignyi* in the eastern Pacific Ocean. Inquiries were made of curators of major U. S.

museum collections and owners of several large private collections for possible additional eastern Pacific records. Some time ago, Carol Skoglund generously lent the senior author part of the material originally cited by Walls for study. She also informed him that additional specimens of *C. orbignyi* were said to have been trawled off the Islas Tres Marias, off Nayarit, Mexico, but she could not locate this material at that time. The Nayarit specimens came to light when Virginia Upton purchased Mr. Kerstitch's Panamic Province collection of mollusks. At the suggestion of Ms. Skoglund, Ms. Upton kindly offered these specimens to us for study and report.

RESULTS

Records of *Conus orbignyi* as reported from West Mexican waters

Records from Baja California Sur:

1. A well-preserved living specimen was taken by SCUBA diving off Cabo San Lucas (22° 53'N, 109° 58'W) in "250 ft. [76 meters] in rock, Aug. 1970," by Alex Kerstitch. The specimen (AMNH 23215; ex Skoglund) measures 33.2 mm in length, 11.2 mm in width and possesses 8 post-embryonic whorls; the animal was preserved within the shell (Figures 1-2).

2. Two specimens, one living, were trawled at depths of 250-300 m by the shrimp vessel "La Sirena" on the Gorda Banks, in the Gulf of California (23° 11'N, 109° 24'W) on the sand and mud, July, 1979 (Kerstitch field no. 740712). These specimens measure, respectively, 38.2 mm in length, 13.3 mm in width, and 34.3 mm in length, 12.3 mm in width; both have 8+ post-embryonic whorls. The larger specimen was collected alive and both specimens have badly broken lips. The writers do not know the present deposition of these specimens. According to Mr. Kerstitch (*in litt.* January 29, 1979), they were sent to Dr. R. Tucker Abbott at the Delaware Museum of Natural History, but they could not be located there (R. Bieler, *in litt.*, March 1989).

3. Two fragmental specimens were dredged off Cabo San Lucas in 110-128 m (60-70 fms.) on July 13, 1972 by Alex Kerstitch (AMNH 232116; ex-Skoglund Collection). The larger specimen (28.3 mm in length) has the entire spire and part of the dorsum of the body whorl preserved, whereas only the basal part of the body whorl remains of the second, badly stained fragment.

Records for Islas Tres Marias, Nayarit, Mexico (21° 30'N):

1. One specimen, "trawled off the Isla [sic] Tres Marias, in 50 fathoms [91 m], by Captain Luna, Feb. 1970." Record based on a photograph of a specimen measuring 25.3 mm in length in the Luna Collection and submitted to the senior author by Alex Kerstitch in May 1980. The present deposition of this specimen is not known to the writers.

2. Three specimens "trawled by shrimpers in 100 fm. [183 m] off Isl. Tres Marias, February 26, 1976" (Kerstitch no 760706). The specimens measure, respectively, 35.8 mm in length and 11.9 mm in width (Upton collection); 34 mm in length and 11.4 mm in width (Upton Collection); and 21.6 mm in length, 7.1 mm in width (AMNH 232121b; ex-Upton Collection) (Figures 3-4). All have badly broken lips.

In summary, this report is based on the examination by the senior author of nine specimens of *Conus orbignyi* labeled as being from west Mexican waters, five from off Cabo San Lucas and four from off the Islas Tres Marias. All of these reports are based on specimens originally in the Luna and Kerstitch collections. Additional specimens were stated by Mr. Kerstitch to have been collected by shrimpers in these areas and to be in the personal collections of Margaret Cunningham and Captain Antonio Luna, both of whom resided in Guaymas, Sonora, Mexico at that time (*in litt.*, January 29, 1979). The present deposition of these specimens is not known, nor have we examined them.

A perusal of 45 lots, totaling approximately 75 specimens, from the Indo-west Pacific region in the AMNH collections confirms the observations of Walls (1979:775) on the extreme variation of shell characters exhibited in *Conus orbignyi*. The height of the spire varies from highly attenuated to low and squat, and the strongly developed nodes on the spire may be obsolete on the shoulder of some specimens. The strength of the spiral sculpture varies from strong ridges to weak lirae within populations. Japanese specimens (AMNH 213102) may attain nearly 80 mm in length, with 9+ post-embryonic whorls, and specimens from off east Africa (AMNH 231721) reach nearly 70 mm in length with same number of post-embryonic whorls. In contrast, the largest west Mexican specimen we have seen measures 41+ mm in length.

When the nine west Mexican specimens cited above are compared with similar-size western Pacific specimens, there can be no doubt that these specimens are referable to *Conus orbignyi*.

Conus emersoni Hanna (1963: 25, pl. 1, fig. 2,

holotype AMNH 92200) is the only conid species known from eastern Pacific waters that might be confused with *C. orbignyi*. *Conus emersoni* was based on two dead and faded specimens dredged in 549 m [300 fm.] off Bahia Los Frailes, Baja California del Sur, in a haul that contained both Recent and fossil mollusks, including fragments of a late Pliocene pectinid identified by Leo G. Hertlein as *Patinopecten* cf. *P. bakeri marguerensis* Durham, 1950. Walls (1979:774-776) questionably referred *C. emersoni* to the synonymy of *C. orbignyi* largely on the basis of somewhat similar shell morphology and on the assumption that both occurred in deep water off the Cape region of Baja California. Coomans, Moolenbeek & Wils (1986:114) tentatively accepted the validity of *C. emersoni*, but suggested the possibility that it was based on fossil specimens. However, eight specimens, three of which were live-taken, of *C. emersoni* subsequently came to light in material dredged in 310 m (170 fm.) off Isla Santa María [Floreana Island] in the Galapagos Islands by A. and J. DeRoy in 1979. Tucker & McLean (1993:29-32, figs. 1-13) referred these Galapagan specimens to the subgenus *Profundiconus* on the basis of shell, operculum and radula characters and they concluded that *C. emersoni* and *C. orbignyi* are not conspecific.

Temporal, Bathymetric, and Biogeographical Considerations

Fossil records for *Conus (Aspella) orbignyi* are reported from Plio-Pleistocene strata in Japan (Nomura, 1935). Recent specimens of this taxon are commonly obtained by dredging or trawling on the lower parts of the continental shelf or on the upper parts of the slope. Based on the AMNH collection, the average depth is 240 m (7 lots: 70 to 372 m) for the western Indian Ocean and 137 m (9 lots: 82 to 200 m) for the western Pacific Ocean, including Japan, the Ryukyu Islands, the Philippine Islands and Australia. The depths given for the specimens said to be from west Mexico range from 76 to 300 m.

In the Indo-Pacific region, this species is known to occur only on the African, Eurasian and Indian-Australian Lithospheric Plates. The apparent absence of this taxon on the Pacific Plate and its distribution elsewhere in the Pacific Basin only as far eastward as the margin of the Pacific Plate means that its natural occurrence off Baja California is a true biogeographical puzzle.

In contrast, the three Indo-west Pacific conids known to occur in west American tropical waters are distributed

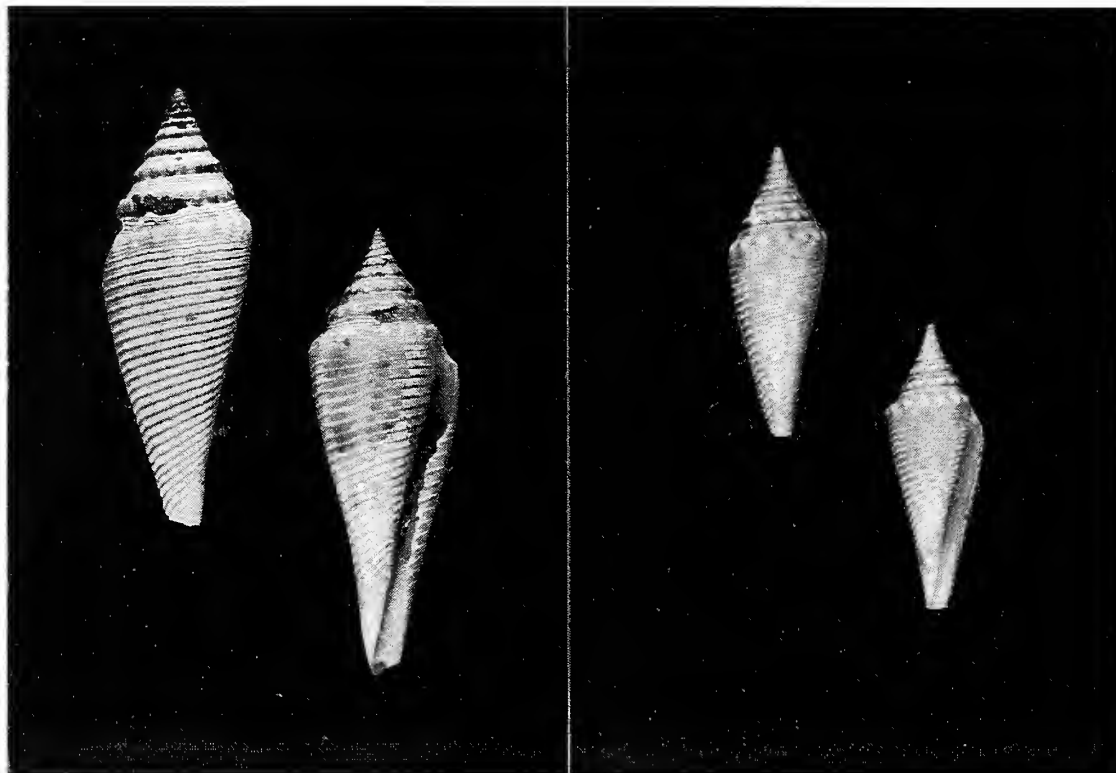
in the Pacific Basin from the Old World mainland across the Pacific Plate to the central Pacific (French Polynesia and the Line Islands) and on to the eastern Pacific Oceanic Islands and the New World mainland. This distribution pattern is typical for the prosobranch gastropods comprising the Indo-Pacific faunal element occurring in the eastern Pacific (Emerson & Chaney, 1995).

Thus, *C. tessulatus* Born, 1778 is recorded from Clipperton Island, the Revillagigedo Islands, Cocos Island, and the Galapagos Islands, as well as the mainland (west Mexico and Panama). *Conus chaldaeus* (Röding, 1798) and *C. ebraeus* Linnaeus, 1758, have the same distributional pattern except they are not known from the Revillagigedo Islands and are more widely dispersed on the continental borderland (Emerson, 1991; Finet, 1994).

DISCUSSION

In December of 1990, the junior author visited the Department of Biology at the University of Arizona where he located two lots in the invertebrate collection labeled *Conus emersoni* Hanna. These were determined without question to be referable to *C. orbignyi*. One lot (ICDBUA 18697) reads: "Cabo San Lucas, Baja California, Mexico (West of Bahía Santa Maria,) depth 15-25', coral, rock, and sand, temperature 23.5-24.0°C, 26-28-Dec. 1973, A. Kerstitch!" This is a very unlikely shallow depth for this species. The label of the other lot (ICDBUA 16031) reads: "Collected at Isla Farallon (San Ignacio), off Topolobampo, Mexico; from shrimp boat trawl (300 ft.) North West 1/2 mile from Isla Farallon, June 1969, A. Kerstitch!" In the same collection drawer at ICDBUA he also located six lots of *Conus orbignyi* from the James E. Norton Collection dredged in the Philippine Islands. Mr. Norton undertook extensive dredging expeditions in the Philippines. Elements of his vast collection were deposited in the ICDBUA, the Los Angeles County Museum of Natural History and the Delaware Museum of Natural History. The AMNH also received many lots of the Norton Collection by exchange from the Delaware Museum of Natural History. One of Norton's Philippine lots of 8 specimens (AMNH 269009) of *C. orbignyi* from "Batangas, Luzon" has several specimens encrusted by dark algal growths on the spire that closely resemble similar encrustations on some of the specimens purported to be from west Mexico (Figures 1-4).

Our investigation has failed to find additional eastern Pacific specimens of *C. orbignyi* from other sources,



Figures 1-4 (l-r). Specimens of *Conus orbigny* purported to have been collected in west Mexico waters. Figures 1-2, off Cabo San Lucas, Baja California Sur, AMNH 232115; X2. Figures 3-4, off Islas Tres Marias, AMNH 232121b; X2.

despite the numerous dredging operations that have been undertaken in these waters during this century. These oceanographic operations include among others The Voyage of the *Albatross* to the Gulf of California, 1911 (Townsend, 1916), The Templeton Crocker Expedition, 1936 (Beebe, 1937), The Allan Hancock Pacific Expeditions, 1931-1942 (Fraser, 1943; McCulloch, 1977), The *Puritan*-American Museum of Natural History Expedition to Western Mexico, 1957 (Emerson, 1958), as well as several cruises conducted by The California Academy of Sciences and The Scripps Institution of Oceanography to the Gulf of California, from 1920's to the 1940's and many other institutional and private operations in recent years.

In the absence of verified eastern Pacific occurrences of *Conus orbigny* from any other sources and the fact that there has been no published reports of its occurrence anywhere on the Pacific Plate, we are not convinced of the accuracy of the collection records reported above and also reject the Kerstitch-ICDBUA "west Mexican" records, believing those to actually represent Norton's Philippine specimens which were mislabeled at the time of curation. Until such time as this matter can be clarified

with additional information the presence or absence of *Conus orbigny* off west Mexico should be relegated to a footnote in any discussion of eastern Pacific conid biogeography.

ACKNOWLEDGMENTS

We are indebted to Carol Skoglund (Phoenix, AZ) for originally calling our attention to critical material in the Kerstitch Collection and to her and Virginia Upton (Sierra Vista, AZ) for making their specimens available for study and for generously donating voucher specimens. We thank the following for providing information and/or specimens: Gary Rosenberg (Philadelphia Academy of Sciences, PA), Raye N. Germon (National Museum of Natural History, Washington, DC), Robert Van Syoc (California Academy of Sciences, San Francisco), Alan J. Kohn (University of Washington, Seattle), Rüdiger Bieler (then of Delaware Museum of Natural History), Phil Hastings (ICDBUA), Helen DuShane (Whittier, CA), Alex Kerstitch (Tucson, AZ), James H. McLean (Los Angeles County Museum of Natural History, CA), Donald R. Shasky (Oceanside, CA), John K. Tucker

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THE GREAT *SPONDYLUS* HUNT OR DIVING IN BAJA WITH PETER CLARKSON

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Baja California is not just a place - it is a state of mind. I hardly need tell this to members of the San Diego shell Club. John Jackson, Larry Buck and Charlie Waters had been telling me this for several years before I finally had the opportunity to dive there.

My chance finally came during the Conchologists of America convention hosted by the San Diego Shell Club in June 1995. At the time, I was living in Mexico City - which is technically part of the same country as Baja, but in reality is a million miles from the Baja state of mind. No one I knew in Mexico City had ever been to Baja. The air connections are expensive and not very convenient to Cabo from Mexico City, and the much closer beach resorts of Acapulco and Ixtapa beckon. For most Mexicans, Baja is just a large empty space on the map.

Coming from Canada, I feel at home in empty spaces. I also found a lot of similarities between the way people in southern California regard Baja, and the way people in New York regard Ontario: it's that wilder, simpler, more essential place over the border.

Sitting in the bar in the Pan Pacific Hotel in "June gloom" filled San Diego, I began plotting my trip with John Jackson and a new friend from Australia - the well-known shell diver, Peter Clarkson. Peter leads an interesting life. For five months a year he lives in the small town of Port Lincoln, in South Australia, where he works a commercial abalone license. When the weather permits him to dive, Peter spends up to eight hours a day in the water wearing a $\frac{3}{8}$ inch wetsuit in the winter months, a physically and mentally taxing work. The rest of the year Peter enjoys his two specialties: self-collected Australian *Zoila* and worldwide *Spondylus*. It was the *Spondylus* which drew him to Baja.

We plotted a two week trip that would take us three quarters of the way down the Peninsula and back. John Jackson very generously lent us his Suburban, plus six

dive tanks and weights, along with all the sound advice about road conditions that we could write down in the margin of our map. For the first leg of the journey, Larry Buck would be the wagon master, leading us as far as Bahía de los Angeles. Then we would move on our own down to Loreto, where we would meet John, who would fly in from San Diego. A four-day cruise followed on a motor launch captained by a friend of John's taking us from Loreto down to La Paz. There we would catch a plane back to Loreto, followed by the long drive back to San Diego. Total distance to be covered in two weeks: 1250 miles from San Diego to La Paz and back.

I don't know what it is about the genetic makeup of building contractors which inspire them to start their day at four in the morning but Larry was as chipper as a boy scout when we staggered up his driveway at 4:00 a.m. ready to start the long haul south. We picked up Lach Noyes along the way and crossed the border by 5:00 a.m. All three of our cars were rigged with CB radios for communication, which enabled us to spend the hours, as the scenery sped past, babbling about the shells we had bought and wished we had bought at the COA bourse. I have no idea what the Mexican highway police, if they tuned into our CB frequency, would have made of us.

For the first three hours, we drove under overcast skies, along the cool rainy northern Pacific coast of Baja. When we turned inland at El Rosario, the temperature and landscape changed markedly into the rocky desert I had expected to see. The final hour of that drive was the most impressive - along the 40-kilometer side road off Baja 1 that leads to a small port on the Gulf side of the peninsula, at Bahía de los Angeles. The Sonoran Desert vegetation here is particularly well developed: tall cardón cactus are

interspersed between thickets of the strange cirio tree, which seems all bark and thorns with only a tiny green growing shoot at the top of its spindly 40-foot trunk.

We finally came over a gentle rise and saw the entire spectacular expanse of "L.A. Bay" laid out before us - a deep bay, divided by two peninsulas, filled with rocky islets and islands of all sizes (Figure 1). The

expectations for L.A. Bay - Larry had told me he mostly dove there to keep company with some old fishing buddies. Instead, Peter and I were very pleasantly surprised. The water was cool, but not cold - about 71-72°F - and the visibility was about 50 feet. The terrain consists mostly of smooth stones and boulders, densely covered in algae sloping down to a coarse sandy bottom. Much of the invertebrate life was markedly different from anything else I had seen along the Pacific coast of the Mexican mainland, such as the large maroon and purple Gulf Sun Star, *Heliaster kubinji*, draped over the rocks and the voracious Sea Tiger, *Roboastrea tigris*, hunting other nudibranchs such as the Blue Striped Sea Slug, *Tambja eliora*, among the algae. The mollusks were very different from other places I had dived too. *Cypraea annettae* Dall, 1909, were abundant under the stones in shallow water, with many of the females roosting on purple and white egg masses (why the eggs would come in two different colors puzzled me). It was the only *Cypraea* to be found. On the sand at the bottom on the reef slope, the small Panamic volute *Enaeta cumingii* (Broderip, 1832) was easy to find, along with the wrinkled bivalve *Chione tumens* (Verrill, 1870) and large *Turritella mariana* Dall, 1908. The largest species around was *Cymatium parthenopeum keenae* (Beu, 1970) which we would see clinging to the smooth angled exposed face of boulders, at anywhere from 20 to 80 feet. The thick periostracum of this shell gives it, in Larry's words, a "woolly mammoth" look which can make it hard to spot on the algae covered surfaces.

The most intriguing find was the delicate, frilly muricid *Pteropurpura erinacioides* (Valenciennes, 1832) (Figure 2). Peter was the first to find these shells, on his first-ever dive in the Panamic region. He used the same logic he used in the Solomon Islands to find murex: he would look for a smooth rock face which descends under the sand with a few dead bivalve shells on top of the sand (indicating a predatory murex nearby). Then he would fan the sand carefully to reveal the murex clinging to the rock face below the sand line. Once this technique was explained to me, I applied it diligently, and was rewarded with one *P. erinacioides*. Peter applied it haphazardly as he cruised along looking for *Spondylus* and casually found sixteen specimens. I guess that is the difference between an amateur and a pro!

After two days of very pleasant diving around the tranquil waters of L.A. Bay, we moved on. The road south took us through the Vizcaino Desert, around the



Figure 1. Map of Bahía de los Angeles, Golfo de California. (Map not to scale).

mountains of Isla Angel de la Guarda dominate the horizon - the largest of all the islands in the Golfo de California. Larry and Lach peeled off for a campsite on a pebbly beach along the outer peninsula at Punta la Gringa. Peter and I headed out to find a motel in the small, dusty fishing town.

For the next two days we rented a panga and dove in various spots around the bay. I had not had high

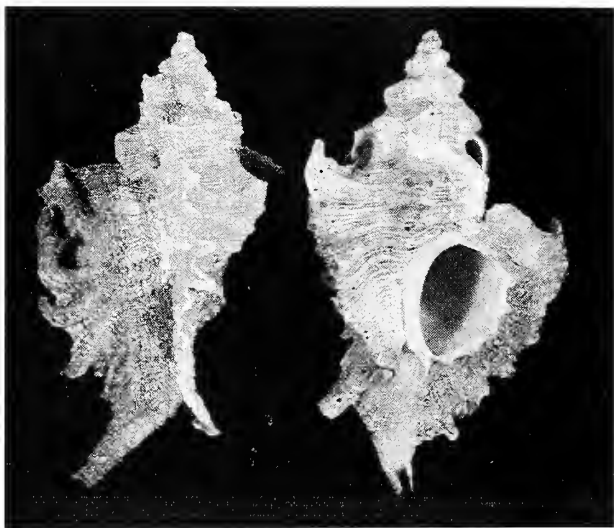


Figure 2. *Pteropurpura erinaceoides* (Valenciennes, 1832). Two specimens, left: dorsal view, L= 31.4 mm; right: apertural view, L= 31.3 mm. Photo: D. K. Mulliner.

two more northerly grey whale calving bays at Scammon's Lagoon and San Ignacio. At the bleakest point in the desert, the horizon was pierced by an enormous steel sculpture which I could not decipher: it looked exactly like a marooned "walker" out of "Star Wars". It finally turned out to be a 50-foot high screaming eagle, made of steel bars, deposited in the desert to mark the otherwise invisible boundary between Baja California and Baja California Sur. A more tranquil sight was the oasis of San Ignacio, covered in date palms which were brought to Baja by the Jesuits in the 18th Century. The Jesuit mission at San Ignacio is reckoned to be one of the finest on the peninsula. At the end of the drive, we checked into a better-known 20th Century way station - the La Serenidad Hotel outside of Mulegé, which has catered to visiting pilots for years with its famous Saturday evening pig roasts.

We passed on the pig roast and headed directly to the spectacular natural cul-de-sac south of Mulegé - Bahía Concepción. We parked our car at the sandspit in front of the small island of La Requesón and swam around to the far side of the island. In the past, this has been one of the best collecting spots in Baja - but not in mid-summer of 1995. The bay seemed to be going through an ecological down cycle in which most of the mollusks had died. We found hundreds of dead *Strombus gracilior* Sowerby, 1825, and no live *Spondylus*. The only shells we found in profusion were

live *Strombus granulatus* (Swainson, 1822), in a belt of cold water ($\pm 72^{\circ}\text{F}$) below 30 feet. I did, however, find one of the interesting dwarf forms of *Cypraea annettae*, which are only known from Bahía Concepción (it was fully mature at 26 mm).

The subsequent day we moved further south, close to the southern end of the bay and did a shore dive. This revealed a bit more life: on the flat silt at 30 feet, both live *Strombus gracilior* and *S. granulatus* were abundant in distinct bands along with *Chicoreus erythrostomus* (Swainson, 1831) and *Hexaplex nigrinus* (Philippi, 1845) and one *Haustellum ruthae* (Vokes, 1988). I was pleased to see one of the pink-edged "lipstick" forms of *Hexaplex erythrostomus* which are known from Bahía Concepción.

Loreto was our next stop south. If I ever decide to drop out of life and put my feet up somewhere in Baja, Loreto is where I would do it. The town is large enough (17,000 people) to have an airport with a couple of flights a day to points north (San Diego) and south (La Paz); yet it preserves the languor of Baja, particularly at midday in July. It has a quiet strait in front of it sheltered by Isla Carmen, mountains behind it and a wide malecón with a few pangas pulled up on the shore (see Figure 3). We settled into a fisherman's



Figure 3. Map of area around Loreto, Baja California Sur, México. (Map not to scale.)

hotel, the Oasis, and in short order hired a panga, found a place to fill tanks, and discovered an American-run pizzeria which sold Baja rock-art T-shirts. The owner,

under interrogation from Peter, cheerfully admitted that the T-shirts were actually copies of Australian aboriginal art rather than the original Baja petroglyphs found a few miles inland. It's a small world.

We spent the next couple of days in the area around Loreto and did much of our best diving there, first from a panga and then from a motor launch which picked us up in Loreto. Peter hit *Spondylus* heaven at the well-known spot off the northern tip of Isla Danzante. Below 120 feet, the steep, rubbly slope is covered in long-spined, red and white *Spondylus princeps* Broderip, 1833, in a bewildering variety of sizes and shapes. The only limitation on the variety of forms you can see is the sharp decompression limits imposed by the depth. Closer to shore, Peter found a number of fine purplish, short-spined *Spondylus calcifer* Carpenter, 1857, under the dock at Puerto Escondido, south of Loreto. Just north of there was Punta Coyote, where we found *Oliva porphyria* (Linnaeus, 1758) making trails in the early morning light; and along a deep reef, extending east of Punta Coyote, John Jackson (who had joined us by that time) found an outstanding specimen of the fine, frilly black *Hexaplex ambiguus* (Reeve, 1845). Another notable spot was a high point south of Isla Carmen, where the reef structure consisted of white sand patches between rocky ridges at 30-40 feet. A night dive on this formation turned up no less than three *Cypraeassis tenuis* (Wood, 1928) - all dead, but exciting finds nonetheless.

For the next three days, we sailed south from Loreto to La Paz making diving stops along the chain of islands - Isla Catalina, Isla Santa Cruz, Isla San Diego, Isla San José and Isla Espíritu Santo. The cruising was delightful, even if the mollusk life was not particularly remarkable - in part because the full moon suppressed much of the mollusk life we hoped to see night diving. Nevertheless, in one sandy bay around Isla San Francisco, I found a number of pretty, small olives, which I assumed to be *Oliva spicata* (Röding, 1798) - until I returned home and realized they were the more unusual *Oliva venulata* Lamarck, 1811 (Figure 4). The most significant find was several small specimens of the Indo-Pacific migrant, *Conus tessulatus* Born, 1778, including one at the bottom of a rock face along the northern tip of Isla Santa Cruz, which is about 50 miles further north than had been recorded before (see Jackson, 1994).

I will remember this region for two spectacular

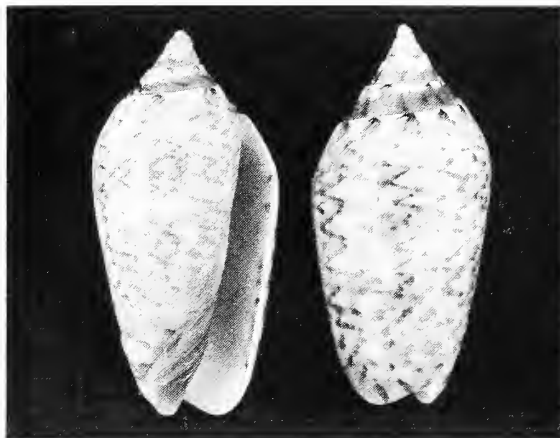


Figure 4. *Oliva venulata* Lamarck, 1811. Two specimens, left: apertural view, L=31.3 mm; right: dorsal view, L= 31.4 mm. Photo: D. K. Mulliner.

dives. The first was at Los Islotes - a well-known sea lion colony, where the visibility was spectacular. We dove around steep building blocks of basalt, negotiating our way around the strong currents, and the hovering schools of jacks, while sea lions did somersaults in our bubbles. The second was on the wreck of the ferry *Salvatierra* which is now festooned with yellow and black gorgonians around the overhangs and swim-throughs in the ship's structure. Peter had no success finding *Spondylus* on the flat surfaces of the wreck (normally prime *Spondylus* territory), but I did rather better turning pieces of metal and finding half a dozen *Colubraria lucasensis* Strong & Hertlein, 1937, and a pair of *Bailya anomala* (Hinds, 1844) underneath.

After four days around the islands, we finally splashed ashore at La Paz, the capital of Baja California Sur and caught a 25-minute flight north back to Loreto. There we retrieved John Jackson's Suburban from the parking lot of the Hotel Oasis and began the long trek north. The drive was enlivened when we decided to ignore Larry Buck's one cardinal rule of Baja motoring - fill up at every gas station which has gas. For this astute decision, we were rewarded by almost running out of gas when the station in Cataviña we had counted on to supply us suddenly proved to be dry. We crept along for the next 200 kilometers to El Rosario, largely on prayer. Finally, a day and a half after leaving Loreto we rolled back up John's driveway in El Cajon. We were home.

My thanks to Dave Mulliner for the fine

photography in Figures 2 and 4.

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THE FESTIVUS

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Meeting date: third Thursday, 7:30 PM
Room 104, Casa Del Prado, Balboa Park

PROGRAM

Minute Shell Photography

Dave Mulliner, award-winning underwater photographer, *The Festivus* Staff Photographer, and Club member, will present a talk on his equipment and techniques in

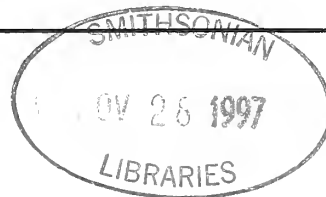
photographing micromollusks. He will illustrate his program with beautiful slides of micromollusks and have a display of his photographic equipment.

Book and Sweatshirt Sale

Meeting date: 20 November
Shells of the month: micromollusks

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CLUB NEWS

Minutes of the San Diego Shell Club Meeting - October 16, 1997

The meeting was called to order by President Terry Arnold at 7:45 p.m. After the minutes were accepted as published in *The Festivus*, the upcoming Christmas Party was discussed [see below].

Then Terry presented the slate of officers for 1998 as proposed by the nominating committee. They are as follows: President, Wes Farmer; Vice-President, Don Shasky; Recording Secretary, Silvana Vollero; Corresponding Secretary, Kim Hutsell; Treasurer, Margaret Mulliner; Editor, Carole Hertz. At the November meeting, nominations from the floor will be entertained followed by election of officers for 1998. The officers will be installed at the Christmas Party.

The evening's speaker, Kathie Kalohi, President of the Pacific Shell Club and San Diego Shell Club member, was introduced by Wes and gave a slide show on her diving trips with her husband, Joe, in several western Canadian sites around Vancouver. Despite lighting problems at the meeting, which precluded a darkened room, Kathie's program of beautiful slides, both below and above water, and enthusiastic narrative was greatly enjoyed by those in attendance. Kathie also brought in a display of shells from the area and a framed photograph of a shark she pursued for a closeup shot.

Following Kathie's program, members enjoyed the delicious home-baked cookies provided by Billee Brown and Twila Bratcher-Critchlow and talking more with Kathie and Joe about their dives.

The Annual Christmas Dinner Party

The annual Christmas Party on Saturday evening December 6th in the Montfield Room of the Sheraton Four Points will begin at 6:00 p.m. with a no-host bar, followed by dinner served at 7:00 p.m.

Dinners include tossed green salad, vegetables, red roasted potatoes, rolls and butter, dessert of white chocolate mousse with fresh berries and coffee or tea and dinner wine provided by the Club.

Entree choices are Chicken Breast stuffed with Spinach, Mushrooms and Sun-dried Tomatoes with a Garlic Cream Sauce @ \$23.00 or Oven Roast Pork Loin with Bordelaise Mint Sauce @ \$25.00. A vegetarian plate (Pasta Primavera with vegetables and Marinara

Sauce) is also available at \$23.00. Prices include tax and gratuity.

As part of the evening, remember to participate in the traditional shell gift exchange. Bring a gift-wrapped shell gift noting only very general locality on the outside. These gifts are placed under the tree and selected by drawn number after the dinner and program.

If you have slides to share as part of the evening's program, contact Carole Hertz (619-277-6259).

For those who would like to spend the night, the Four Points offers the special rate of \$55 plus occupancy tax. Dinner reservations [your check with entree choice noted] must be received by December 1.

Plan to attend. It's always a wonderful party.

Second Annual Gathering of the Southern California Unified Malacologists (SCUM)

On Saturday 10 January, SCUM, an informal association of professional, amateur and student malacologists, will hold its second annual "gathering" in the Times Mirror Room of the Natural History Museum of Los Angeles County, hosted by Jim McLean and Lindsey Groves, beginning at 10 a.m.

All persons interested in Recent and/or fossil mollusks are invited. Presentations and discussions are informal and briefly cover current research interests. A slide projector and overhead projector will be available. Coffee and donuts will be provided after 9 a.m. Parking is free. Following the meeting (before 3 p.m.), the museum's mollusk collections will be accessible.

For further information contact the hosts: J. McLean (213-763-3376; e-mail: jmclean@nhm.org or jmclean@usc.edu) or L. Groves (213-746-2999; e-mail: lgroves@nhm.org).

Memberships for 1998

All subscriptions/memberships are now due for 1998. Membership for 1998 is the same as for 1997 (see masthead). Please return enclosed green slips.

Book and Sweatshirt Sale

A "tableful" of used books and reprints on shells and sea life will be on sale at the November meeting, priced to sell. There will also be an opportunity to buy Club sweatshirts at cost - \$10.00 - most sizes available.

SOME UNUSUAL AND FASCINATING *MARGINELLA* FROM THE EASTERN CAPE PROVINCE OF SOUTH AFRICA

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The family Marginellidae is not the most popular family amongst shell collectors but is certainly one of the most beautiful. Only West Africa has more species than South Africa and with the rate at which new species are being discovered in S. Africa, this may soon change. There are currently about 80 named *Marginella* species in South Africa.

Virtually all of S. Africa's *Marginella* species are endemic. There are a great variety of species occurring around its coastline (Figure 1) ranging from minute shells of 1 mm or less to the third largest *Marginella* in the world and the "logo" specimen of the South Africa Conchological Society: *Afrivoluta pringlei* (Tomlin, 1947).

Marginella are usually sand dwellers and sometimes live in sand pockets on the reef. They are scavengers or carnivores, who emerge at night to feed. SCUBA-diving can be very rewarding as the torch beam easily picks up the shiny surface of any marauding *Marginella*!

The animals of *Marginella* are very variable and often more beautiful than the shell itself. Spotted animals are most abundant, but color patterns can also be mottled, plain or striped. *Marginella* can be found under rocks in shallow-water rock pools, to depths of over 200 m off the S. African coast. The eastern Cape area of S. Africa has dozens of species. Six unusual examples are high-lighted here.

Marginella ornata Redfield, 1870 (Figure 2)

This is a fairly common species in the eastern Cape area. It ranges from Jeffreys Bay to East London and its average size is 25 mm. Most predominant colors of the shell are grey-blue or grey-black. Uncommon colors are yellow-brown or pink-red. The specimen featured in Figure 2 is one of the uncommon pink forms and was found at 20 m deep using SCUBA just north of Port Alfred, living on a reef area containing sparse sand

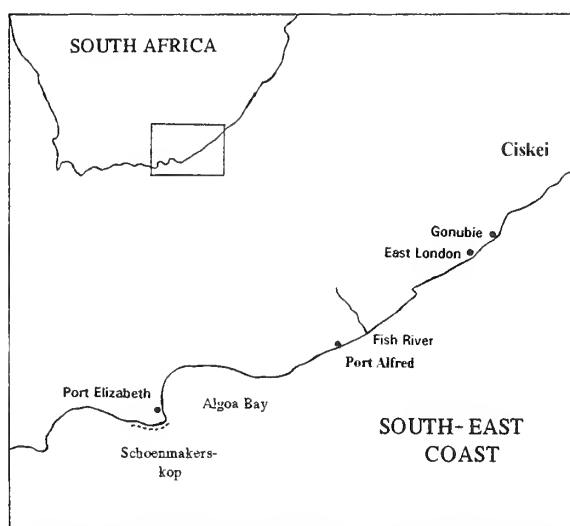


Figure 1. Map showing the southeast coastline of South Africa.

pockets.

No matter what the color of the shell in *M. ornata*, the color of the animal stays the same. The animal is a light beige covered with white spots. The main identifying characteristic of *M. ornata* is that the dorsum has 3 spiral bands and the lip has black dashes or spots.

Marginella peelae Bozzetti, 1993 (Figure 3)

This is a very variable species and is extremely rare. It ranges from Cape Town to East London. Its average size is 26 mm. The western Cape form was named *M. beltmani* Hart, 1993, but is just a geographical variant of *M. peelae*. It lacks the distinctive spiral anterior lines which are present in true *M. peelae*. The western form also tends to be beige in color, becoming more dark brown or grey-blue to the east. The animal of *M. peelae* is either pure white or cream. The specimens from the north of Port Alfred (to

the Transkei) area have a short, blunt spire. The specimen shown in Figure 3 is one of these. Few live-taken specimens of this northerly form have ever been found.

***Marginella spirallineata* Hayes, 1994** (Figure 4)

This unusual species has only recently been described and is very uncommon throughout its range, which stretches from Jeffreys Bay to the Transkei. Its average size is 23 mm. It is rarely found washed up on the beach but can be found using SCUBA, and even dredged down to depths of 120 m. Its closest congener is *Marginella floccata* Sowerby, 1889, from which it differs by having more spotted spiral lines. The shape is also distinctly different. The color of *M. spirallineata* does vary and can be pink, grey, yellow or light brown. The specimen shown in Figure 4 was dredged at 20 m off Algoa Bay. The animal is a creamy-white color with sparse red spotting.

***Marginella lineolata* Sowerby, 1886** (Figure 5)

This species has a very wide distribution extending from Cape Town to north of Port Alfred. It varies greatly in color and size along its range depending on locality and depth. The average size of *M. lineolata* is 27 mm. The western Cape form (from False Bay, Cape Town) tends to be larger, broader and a light cream in color with sparse black markings. Further east, the Algoa Bay form is darker with dense black zig-zag markings. The deep-water variety from 100 m off Algoa Bay is even darker still, being a dark grey-brown.

The specimen shown in Figure 5 is from north of Port Alfred. This is a very rare form having very large wavy black lines. The color also tends to have a little yellow or pink in the shell. The animals of all varieties of *M. lineolata* are more or less constant being white with red spots.

***Marginella albocincta* Sowerby, 1846** (Figure 6)

This is probably a color form of *M. piperata* Hinds, 1844, having reasonably constant coloration which is white with a dark brown band across the

middle of the body whorl. It occurs all along the range of *M. piperata*, from Jeffreys Bay to Transkei. The average size of *M. albocincta* is 13 mm. The animal is always the same as that of *M. piperata*, being a translucent beige color with radiating white lines. *M. albocincta* is fairly uncommon and can be found from depths of 10 to 100 m. The specimen shown in Figure 6 was taken north of the Port Alfred area, by SCUBA on a reef at 20 meters.

***Marginella croukampi* Hayes, 1996** (Figure 7)

This is a new species that is very similar to *M. minuscula* Bartsch, 1815, and cannot easily be distinguished from it in beach specimens which probably explains why it was only discovered recently. With more and more shells being found by SCUBA divers in recent years, live-taken specimens of both species were able to be compared and a new species described.

Marginella croukampi is quite small, averaging 11 mm in length. Its color is cream or beige with black markings on the lip. This is a very rare shell, known only from a few specimens. Its range is from Kenton-on-Sea (just south of Port Alfred) to the Ciskei, about 100 kilometers north of Port Alfred. The specimen in Figure 7 comes from north of Port Alfred and was found at 20 meters on reef by SCUBA.

In conclusion: these are just a few of the larger, more unique *Marginella* specimens that are found off the coast of South Africa. As can be seen from the photographs, they belong to a very captivating group of mollusks.

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HAYES, BRIAN

1994. A comparison between *Marginella ornata* (Redfield, 1870) and *Marginella peelae* Bozzetti, 1993 from South Africa. *World Shells*, March 1994 No. 8.



Figures 2-7. (2, top left) *Marginella ornata* Redfield, 1870, (3, top right) *Marginella peelae* Bozzetti, 1993, (4, center left) *Marginella spiralineata* Hayes, 1994, (5, center right) *Marginella lineolata* Sowerby, 1886, (6, bottom left) *Marginella albocincta* Sowerby, 1846, (7, bottom right) *Marginella croukampi* Hayes, 1996.

THE EASTERN PACIFIC SPORTELLIDAE [BIVALVIA: CYAMIOIDEA]

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The Sportellidae is one of four bivalve families currently placed into the Cyamioidea; others are the Cyamiidae, Bernardinidae, and Neoleptonidae. This array of families is much in need of careful analysis to be certain that it represents a single clade and that these families, including the Sportellidae, each do as well. The purpose of my study was to review the eastern Pacific species that have been allocated to the Sportellidae (Table 1).

Very little is known about the Sportellidae. Sportellids occur around the world, chiefly in the tropics, but they are everywhere uncommon. Judging by the number of fossil taxa of this family -- from the Paleocene to the Pliocene -- the few living species are relics of a once more diverse group. Like other cyamioideans, the Sportellidae have posterior incurrent and excurrent openings, without siphons or with only very short siphons.

The genus *Basterotia* was described by Mayer (1859) based on *corbuloidea*, a Middle Miocene species from the Czech Republic. The subgenus *Basterotella* Olsson & Harbison, 1953, was differentiated from *Basterotia* on the basis that it lacks a sharp angle between the central and posterior slopes, has a longer nymph, and is less pustulose. However, the Pliocene type species of *Basterotella*, *Basterotia floridana* (Dall, 1903), has a sharp angle near its umbones, and Recent taxa belonging to *Basterotia* have every combination and degree of these three characters. Little point is served by attempting to allocate the species of *Basterotia* to these two subgenera, leaving either a number of species without subgenera or the subgenera very broadly and complexly defined, and thus I here synonymize *Basterotella* with *Basterotia*.

My pre-study impression of the eastern Pacific taxa of *Basterotia* was that there were probably more names than species. What I found was quite the opposite, with

three new Panamic species among material that was previously placed in the genus and with most species being very widespread but rare. This suggests a specialized, as-yet unknown mode of life, perhaps commensalism.

Species of *Basterotia* occur in shallow water and have a shell that is ovate to ovate-trigonal. The central slope is set off from the posterior slope by an angle, which is rounded in some, to sharp and carinate in others. The external surface is lightly to heavily pustulose. Both valves have single, projecting anterior cardinals. The external portion of the ligament is of moderate length to very short in some; internal portion of the ligament is a relatively small, triangular area adjacent to external portion.

The species were found to differ from each other in overall shape, the extent of surface pustulation, the strength of the ridge separating the central from the posterior slope, pallial sinus shape, and many details of the hinge and ligament.

Basterotia californica Durham, 1950 (Figures 1, 3, 4), was described from the Pleistocene of the southern Golfo de California. Although the unique holotype has been lost, the original description and illustrations are sufficient to permit its recognition as a distinct species also present in the Recent fauna of northwest México. The most nearly equilateral species, it occurs from Isla Cedros, on the outer coast of Baja California, into and throughout the Golfo de California.

Basterotia A (Figures 5, 6) is a rare new species with a thin, oblique shell. It is known from only four lots, all obtained dead. The type lot will be from the Guaymas, Sonora area, and there is a single valve from southern Baja California, and single specimens from each of two stations in the Islas Galápagos.

Basterotia B (Figure 7) is a second new species, with an ovate-trapezoidal shell, a relatively strong angle

Table 1. Some Key Characters for Eastern Pacific Sportellids

	Shape (l/h)	Beaks Toward Posterior End	Central/Posterior Slope Demarcation	Sculpture	Max. Size, mm	Number Recent E. Pacific Lots
<i>Basterotia californica</i>	ovate- elongate (1.6)	60-70%	rounded angle	growth checks only	12.5	29
<i>Basterotia A</i>	ovate- oblique (1.6)	75-80%	slight angle near beaks	very sparse pustules	10.7	4
<i>Basterotia B</i>	ovate- trapezoidal (1.6)	85%	angle rounded to sharp to carinate	densely pustulose	11.0	82
<i>Basterotia peninsularis</i>	ovate to ovate- trapezoidal	75%	angle rounded	sparse pustules near beaks	18.7	40
<i>Basterotia quadrata</i>	ovate- trigonal (1.1)	70%	sharply angled to carinate	densely pustulose	14.1	13
" <i>Basterotia</i> " C	elongate- rectangular (2.5)	70%	sharply angled to carinate	densely pustulose	11.0	8
<i>Ensitellops hertleini</i>	elongate (2.5)	80%	none	sparsely pustulose	9.4	32
<i>Fabella stearnsii</i>	ovate (1.7)	40%	none	growth checks only	15.6	15
Total						223

between the central and posterior slopes that may be carinate, dense pustules, and a particularly conspicuous escutcheon. It is the most common Panamic species. Live-collected specimens show that when valves are closed, the anterior and ventral margins gape, suggesting a nestling habitat. This species broods its young along its ventral mantle margin. It occurs from Punta San Pablo, on the outer coast of Baja California Sur, throughout the Golfo de California, south to Ecuador, and on six of the Islas Galápagos, with live-collected material obtained under rocks. Material from the southern end of the distribution of this species is more consistently carinate and is also more variable in shape and may be taxonomically distinct.

Basterotia peninsularis (Jordan, 1936) (Figures 8, 9), described from the Pleistocene of Bahía Magdalena, has as synonyms *hertleini* Durham, 1950, and *ecuadoriana* Olsson, 1961. It has an ovate to ovate-trapezoidal shell that is only sparsely pustulose, and it lacks an angle between the central and posterior slopes. The largest species of the genus, it attains 19 mm in length. It occurs from the Golfo de California to Ecuador, and on two of the Islas Galápagos. It is also known from the Pliocene of southern California and from the islands in the southern Golfo de California and the Pleistocene of Bahía Magdalena, Baja California Sur. *Basterotia peninsularis* is most similar to the western Atlantic *B. elliptica* Récluz, 1850, differing in shape and hinge features.

Unfortunately, the material referred to and illustrated as *B. peninsularis* by Durham (1950) from the Pleistocene of the southern Golfo de California consists of specimens that are strongly carinate and heavily pustulose. These specimens are morphologically intermediate between *B. quadrata*,

which I discuss below, and my new *Basterotia B.* Durham's figures were reproduced in Keen (1958, 1971), forming a mistaken concept of *B. peninsularis* among students of the Recent Panamic fauna. These Pleistocene specimens may be assignable to *Basterotia B.* or they may represent an evolutionary stage on the way to it.

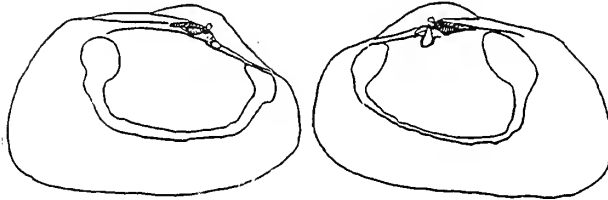
Basterotia quadrata (Hanley, 1843) (Figures 2, 10) has one synonym, *granatina* Dall, 1881. It has a unique ovate-trigonal shape, with very prominent, prosogyrous beaks and heavy pustules. In the eastern Pacific, it occurs throughout the Golfo de California to Ecuador, and on two of the Islas Galápagos. It is also present in the Pleistocene of Ecuador. In the western Atlantic, it occurs from North Carolina, on both coasts of Florida, in the Bahamas, south to Haiti, Guadalupe, and Colombia.

Although overlooked by previous workers, *Basterotia quadrata* was first proposed by Hanley in early 1843 with a poor illustration, many months before the name was made available in a formal description by Hinds (1843). While Hanley's figure, an external view, is not unequivocal, interpreting *quadrata* Hanley as a *nomen dubium* would only create a senior homonym of *quadrata* Hinds. Specimens of this species from the eastern Pacific are indistinguishable from those from the Caribbean. It differs from the similar *B. ambona* Vokes, 1981, from the late Lower Miocene Chipola Formation of Florida, in having a more expanded, denticulate posterodorsal margin. Indeed, *B. quadrata* is very close to *corbulides*, the European type species of *Basterotia*.

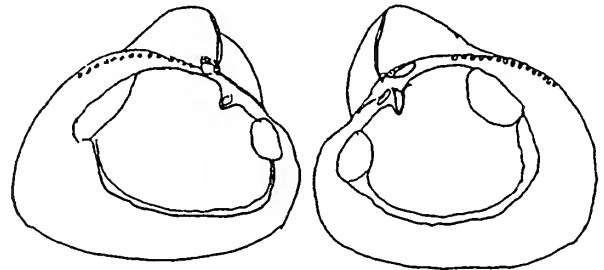
"*Basterotia*"C will be a new genus and a new species (Figures 12, 13), differing from *Basterotia* in shape, in having low, non-projecting hinge teeth; it is



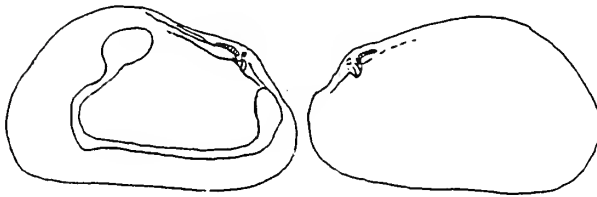
Figures 1, 2. (1) *Basterotia californica*. SBMNH 143609; Bahía San Luis Gonzaga, Baja California, México; about 6 m; pair; length, 10.0 mm. (2) *Basterotia quadrata*. Left valve; LACM 69-24; Bahía San Luis Gonzaga, Baja California, México; about 9 m, length, 13.1 mm.



Figures 3, 4. *Basterotia californica*. (3) Left valve; LACM 71-178.50; Punta San Pablo, Baja California Sur, México; about 26 m; length, 8.9 mm (4) Right valve; SBMNH 143609; Bahía San Luis Gonzaga, Baja California, México; about 6 m; length, 12.5 mm.



Figures 10, 11. *Basterotia quadrata*. (10) Left valve; LACM 69-24.12; Bahía San Luis Gonzaga, Baja California, México; 9 m; length 13.0 mm (11) Right valve; SBMNH 143655; Puerto San Carlos, Sonora, México; 27 m; length 12.6 mm.



Figures 5, 6. *Basterotia* A, new species. (5) Potential holotype, left valve; LACM 2846; 3 mi. S of Las Tetras de Cabra, Bahía San Carlos, Sonora, México; 100 m on bottom of shells, cobbles and silt; length 9.0 mm (6) Potential paratype, right valve (pallial sinus not visible); LACM 2847; same location; length 10.1 mm.



Figures 12, 13. "*Basterotia*," new genus and species. (12) Potential paratype, left valve; SBMNH 144175; Los Frailes, Baja California Sur, México; 60 m; length 7.8 mm (13) Potential holotype, right valve; SBMNH 144174; same location; length 11.0 mm.

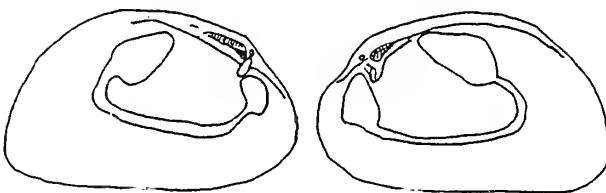
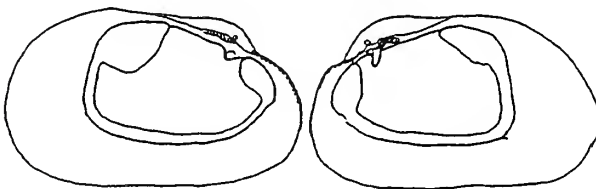


Figure 7. *Basterotia* B, new species; potential holotype, pair; SBMNH 144168; "Tecuan," Jalisco, México (19.3°N, 104.9 °W); in estuary mouth under rocks at low tide; length 7.3 mm.



Figures 8, 9. *Basterotia peninsularis*. (8) Left valve; MNHN; Punta Elena, Guayas Province, Ecuador; length, 18.6 mm (10) Right valve; CAS 106385; Corinto, Chinandega Province, Nicaragua; length, 13.0 mm.

similar to many species of that genus in having the posterior and central slope separated by an angle and in being pustulose. It occurs from Isla Cedros on the outer coast of Baja California, in the Golfo de California, south to Ecuador. This species is thus far known from only eight lots, all obtained dead. This species is similar to "*Basterotia*" *americana* (Dall, 1900), from the Pliocene-Pleistocene Caloosahatchee Formation of Florida, which will also be allocated to this new genus. This genus is thus another paciphile, having survived only in the eastern Pacific.

Ensitellops hertleini Emerson & Puffer, 1957 (Figure 14), of which *pacifica* Olsson, 1961, is a synonym, has a unique, elongate, flattened shell. It occurs from the head of the Golfo de California to Ecuador. This species differs significantly from the Pliocene to Recent western Atlantic type species of the genus, *E. protexta* (Conrad, 1841), which is still flatter and differs in hinge details.

A final species was previously placed in *Sportella* Deshayes, 1858, the type species of which is *dubia* Deshayes, 1824, from the Middle Eocene of France. *Sportella dubia* differs from the New World taxa I now place in *Fabella* Conrad in being equilateral, and it has a longer external ligament and a larger, triangular

resilifer.

Fabella stearnsii (Dall, 1899) (Figure 15) has as a synonym *duhemi* Jordan, 1936. It has a smooth, oval shell that is longer anteriorly. It occurs from the Golfo de California south to the Islas Galápagos. It is also present in the Pleistocene at Bahía Magdalena, Baja California Sur. This species differs from the type species of the genus, *Fabella constricta* (Conrad, 1841), from the Pliocene of North Carolina, in having a shorter posterior end, more oval outline, and in hinge details. *Fabella stearnsii* is also similar to the equally rare Recent western Atlantic *Fabella pilsbryi* (Dall, 1899), which has a narrower anterior end.

Two eastern Pacific species described in the Sportellidae don't belong there at all. *Sportella californica* Dall, 1899, described from Monterey, California, proves to be a member of the galeommatoidean genus *Orobitella*. *Anisodonta pellucida* Dall, 1916, also described from Monterey, is based on a juvenile mactrid.

In summary, then, there are five eastern Pacific species of *Basterotia*, of which two are new, one new

genus, one *Ensitellops*, and one *Fabella*. While I have not studied the Recent species of the western Atlantic carefully, the situation is similar, with perhaps four species of *Basterotia*, one *Ensitellops*, and one *Fabella*. While there is no living species of the new genus in the Atlantic, there is apparently one additional species, *Anisodonta carolina*.

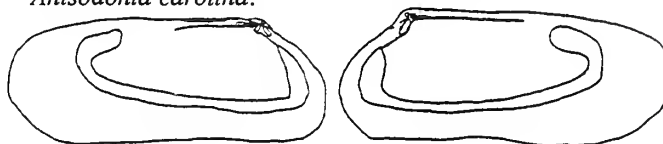


Figure 14. *Ensitellops hertleini*, right and left valves; LACM 40-43.1; Bahía San Felipe, Baja California, México; 5 m; right valve length, 5.7 mm; left valve length, 9.4 mm.

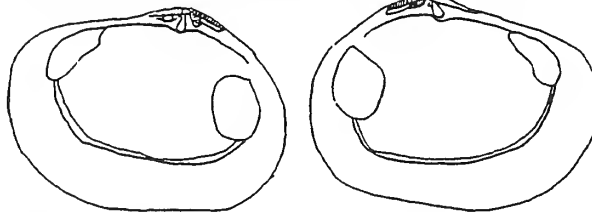


Figure 15. *Fabella stearnsii*, holotype; USNM 73701; Golfo de California; length, 13.6 mm.

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The Festivus Announces a Supplement to Volume XXIX

The Festivus is pleased to announce the publication of a supplement to Volume 29. The over 65-page supplement by Kirstie L. Kaiser entitled **The Recent Molluscan Marine Fauna of the Islas Galápagos** updates previous compilations of the marine molluscan fauna of the Archipelago and includes "documented records, deep-water occurrences, data on endemism and biogeographic relationships."

Over 800 species from the intertidal to deep water are listed. Two annotated appendices are included, one

enumerating accepted species and the other those which are rejected.

The supplement will be published in December and will be available at no charge to 1997 Club members/subscribers. It will only be sent to those who request it by checking and returning the green (chartreuse) slips included with this issue.

The supplement will be available for sale, postpaid, at \$16 (domestic); \$20 (overseas surface mail) and \$25 (overseas air mail) while supplies last.

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